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Summary Report 1984

DOCTORATE RECIPIENTS FROM UNITED STATES UNIVERSITIES

HIGHLIGHTS

- The nearly level trend in the number of doctorates awarded by U.S. universities since the late 1970s continued in 1984, when the total number of research doctorates conferred was 31,253. This number, down from the 1973 peak of 33,755, has not fluctuated by more than 1 percent since 1978.

- Although the number of new Ph.D.s has been stable since the late 1970s, the relative proportion of doctorates earned by men and women has changed. Women have increased their share by one third since 1977, earning 10,660 doctorates in 1984, or 34 percent of the total number conferred. The number of male doctorates has declined by 14 percent since 1977, with men receiving 20,593 Ph.D.s, or 66 percent, in 1984.

- Growth in women's share of Ph.D.s has occurred foremost in the fields of education, health sciences, psychology, and language and literature, disciplines in which women were 50 percent or more of the degree earners in 1984.

- The proportion of doctorates earned by non-U.S. citizens has also been increasing. In 1984 foreign nationals earned 19 percent of the Ph.D.s, reflecting an annual rate of increase of 5 percent since 1980. The number of temporary visa-holders outnumbered the permanent residents 4-to-1. Non-U.S. citizens had their highest concentration in engineering, where temporary visa-holders earned 44 percent of the degrees and permanent visa-holders earned another 9 percent.

- While increments in the proportion of minority degree earners have been slight over the last decade, all minority groups have enhanced their percentage of degrees. Minorities in 1984 earned 11 percent of the Ph.D.s, up 2 points since 1975.

- The median time-lapse from B.A. to Ph.D. has increased since 1970, standing at 10.0 years in 1984. Degree recipients in the physical sciences had the shortest time to Ph.D., 7.2 years. The median period for those in education was the longest, 14.6 years.

- In 1984, 20 percent of doctorate recipients who had postdoctoral employment commitments intended to work in business and industry. Over half (52 percent) of the engineering Ph.D.s reported commitments to business, and 48 percent of the physical scientists made similar commitments.

- The baccalaureate sources of 1984 Ph.D.s were divided into five major types of institutions: Research I, Other Doctorate-Granting, Comprehensive, Liberal Arts, and Specialized. The first three each contributed roughly 28 percent of the graduates who subsequently earned the Ph.D. Liberal Arts colleges were the B.A. source of about 14 percent of doctorates, and Specialized institutions contributed another 2 percent.

- The B.A. sources of 1984 doctorate recipients varied by doctoral field. Ph.D. engineers, for example, overwhelmingly (79 percent) earned their baccalaureate degrees from Doctorate-Granting schools, whereas the majority of education doctorates were graduated from either Comprehensive or Liberal Arts colleges.

- Baccalaureate sources also differed between men and women. Men doctorates were slightly more likely than women to have earned their B.A.s at Doctorate-Granting universities. Women Ph.D.s were more likely to have completed their undergraduate work at Liberal Arts colleges.

- Minority groups also had different baccalaureate experiences. Nearly half of the Asian Ph.D.s came from Research I universities as undergraduates. Close to half of each of the other minority doctorates--American Indians, Blacks, and Hispanics--had attended Comprehensive institutions.

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The Survey of Earned Doctorates is
conducted by the
National Research Council for the
National Science Foundation,
the U.S. Department of Education,
the National Institutes of Health, and
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NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The survey project is part of the program of the Office of Scientific and Engineering Personnel.

This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

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FOREWORD

This report presents a brief summary of the results of the 1983-84 Survey of Earned Doctorates, which has been conducted each year since 1958 by the Office of Scientific and Engineering Personnel (OSEP) of the National Research Council. Questionnaire forms, distributed with the cooperation of the graduate deans of U.S. universities, are filled in by the graduates as they complete all requirements for their doctoral degrees. The doctorates reported here were earned during the period July 1, 1983, through June 30, 1984, and include research and applied-research doctorates in all fields. Professional degrees such as the M.D., D.D.S., O.D., D.V.M, and J.D. are not covered by this survey. A full list of degrees included can be found on the inside back cover; for convenience throughout this report, Ph.D. is used to represent any of the doctorate degrees covered by the survey.

Responses were received from 29,713, or 95 percent, of the 31,253 persons who earned the doctorate in 1984. When individuals did not complete the questionnaire, abbreviated records were compiled using information from the universities' commencement bulletins. As a result, basic information--such as sex, field, institution, and year of Ph.D.--is available for all of the 31,253 doctorate recipients.

This Summary Report is the eighteenth in an annual series of reports that began in 1967. Trend data from earlier periods can be found in the book A Century of Doctorates: Data Analyses of Growth and Change (National Academy of Sciences, 1978). All survey responses become part of the Doctorate Records File (DRF), a virtually complete data bank on doctorate recipients from 1920 to 1984. More than four-fifths of the 787,448 records now in the DRF have come from results of the 1958 to 1984 surveys. For doctorates granted during the 1920 to 1957 period, information was compiled from commencement bulletins, registrars' records, and other published material.

The conduct of the Survey of Earned Doctorates, the maintenance of the resulting data file, and the publication of this report are funded jointly by the National Science Foundation, the U.S. Department of Education, the National Institutes of Health, and the National Endowment for the Humanities. OSEP thanks these agencies for their support. The interest, aid, and counsel of Mary Golladay (NSF), the project officer for the agencies, are appreciated. In addition, Felix Lindsay of the National Science Foundation, George Bowden of the National Institutes of Health, Jeffrey Thomas of the National Endowment for the Humanities, and Charles Miller of the U.S. Department of Education have provided constructive advice on the design and analysis of the survey, a contribution that increases its relevance to national policy issues. We also express our thanks to the graduate deans in the doctorate-granting institutions for their continuing interest in and assistance to this project.

During the data collection period for this report, the Survey of Earned Doctorates was conducted under the direction of Peter Syverson. Susan Coyle, the current project director, was responsible for the development of the summary statistics. Special appreciation also goes to Doris Rogowski and Eileen Milner, who jointly supervised the coding and editing of the data; to George Boyce, manager of the data processing department, and to Joseph Finan and Elise Brand, who were responsible for the computer programming and processing; and to Patricia King for her many contributions to this report.

OSEP is concerned with those activities of the National Research Council that contribute to the more effective development and utilization of the nation's scholars and research personnel. Its programs seek to strengthen higher education and to develop better understanding of the educational process. It is hoped that reporting of the present data to educational, governmental, and professional agencies will facilitate planning in higher education. Suggestions for improvement of the content or format of the report and questions or comments are welcome.

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INTRODUCTION

This report highlights selected observations from the 1984 Survey of Earned Doctorates and examines patterns of degree earning by comparing data with surveys of years past. The report opens with a brief overview of the changing patterns of men and women doctorate recipients by field, followed by trends in foreign citizens' participation in U.S. doctoral education, racial/ethnic status, time to Ph.D., and employment commitments to business and industry.

This year's special section focuses on the baccalaureate sources of the 1984 doctorate recipients. It identifies the types of institutions that produced the scholars who later went on to earn doctoral degrees and discusses ways that institutional "productivity" may be measured. One such measure is used to compare B.A. sources of men and women and of the various ethnic groups.

Earlier reports in the Summary Report series presented highlights on the employment plans and citizenship characteristics of doctorate recipients entering the U.S. labor force (1983) and long-term trends in the plans of new doctorate recipients for postdoctoral study or employment (1982).

TRENDS IN THE NUMBER OF DOCTORATES BY FIELD

Between July 1, 1983, and June 30, 1984, a total of 31,253 research doctorates were awarded by 328 U.S. universities, a total nearly identical to the 31,219 doctorates awarded in 1983. As displayed in Table A and Figure 1, strong growth in the number of Ph.D.s occurred between the 1960s and the early 1970s. Following the peak year of 1973, the annual number of degrees granted declined to 30,875 in 1978 and has remained comparatively stable around a mean of 31,200 since then.

Men and Women Doctorate Recipients

While the total number of new doctorates has been stable since the late 1970s, there have been marked changes in the relative proportions of doctorates earned by men and women (see Table B and Figure 2). During this period of overall stability, both the number and the proportion of women Ph.D.s have increased by 36 percent--from 7,858 in 1977 to 10,660 in 1984--so that women now constitute 34 percent of all new doctorates. The number of doctorates earned by men decreased by 14 percent--from 23,858 to 20,593--during the same period.

TABLE A Doctorates Awarded by United States Universities, 1960-1984

Year	Number	Year	Number	Year	Number
1960	9,733	1969	25,743	1978	30,875
1961	10,413	1970	29,498	1979	31,237
1962	11,500	1971	31,867	1980	31,017
1963	12,728	1972	33,042	1981	31,353
1964	14,325	1973	33,755	1982	31,096
1965	16,340	1974	33,047	1983	31,219
1966	17,949	1975	32,951	1984	31,253
1967	20,403	1976	32,946		
1968	22,936	1977	31,716		

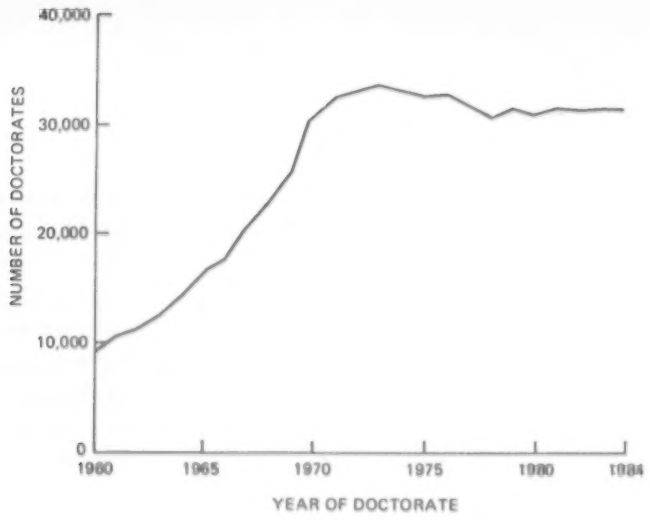

Figure 1 Doctorates awarded by United States universities, 1960-1984.

For men three broad fields--education, humanities, and the social sciences--have accounted for most of the decline in numbers over the last decade: decreases in these fields constituted over three-quarters of the total 1974-1984 change in total number (see Table B). The number of male doctorates increased from 1983 to 1984 in three of the remaining fields--engineering, professional fields, and life sciences (see also Table 1, page 28, for a complete listing of disciplines subsumed under broad fields).

In contrast, two of the most rapidly declining fields for men--education and the social sciences--were responsible for much of the growth in the number of women Ph.D.s in the 10-year period beginning in 1974. Although the number of women

TABLE B Number of Doctorates Awarded by U.S. Universities, by Broad Field and Sex, 1974-1984

Year	Total		Physical Sciences*		Engineering		Life Sciences		Social Sciences		Humanities		Professional Fields		Education	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
1974	26594	6453	4592	384	3114	33	4056	906	4503	1381	3594	1576	1361	220	5302	1939
1975	25750	7200	4454	403	2950	52	4031	995	4544	1522	3359	1687	1334	241	5064	2294
1976	25262	7684	4089	420	2780	54	4013	1013	4580	1634	3208	1673	1374	336	5185	2540
1977	23858	7858	3949	430	2569	74	3892	1028	4348	1725	2903	1659	1311	349	4870	2585
1978	22553	8322	3754	439	2370	53	3881	1159	4178	1861	2635	1596	1389	352	4339	2855
1979	22300	8937	3803	496	2428	62	3952	1271	3969	1992	2547	1592	1309	408	4277	3108
1980	21610	9407	3609	502	2389	90	4047	1414	3811	2045	2335	1532	1201	433	4204	3383
1981	21461	9892	3667	503	2429	99	4076	1535	3945	2197	2200	1548	1160	462	3952	3540
1982	21006	10090	3715	576	2522	124	4071	1635	3679	2157	2049	1509	1238	546	3712	3539
1983	20718	10501	3809	617	2657	124	3829	1718	3676	2381	1964	1531	1219	508	3551	3813
1984	20593	10660	3797	656	2763	152	3957	1788	3488	2407	1942	1586	1313	604	3323	3457

*Includes mathematics and computer sciences.

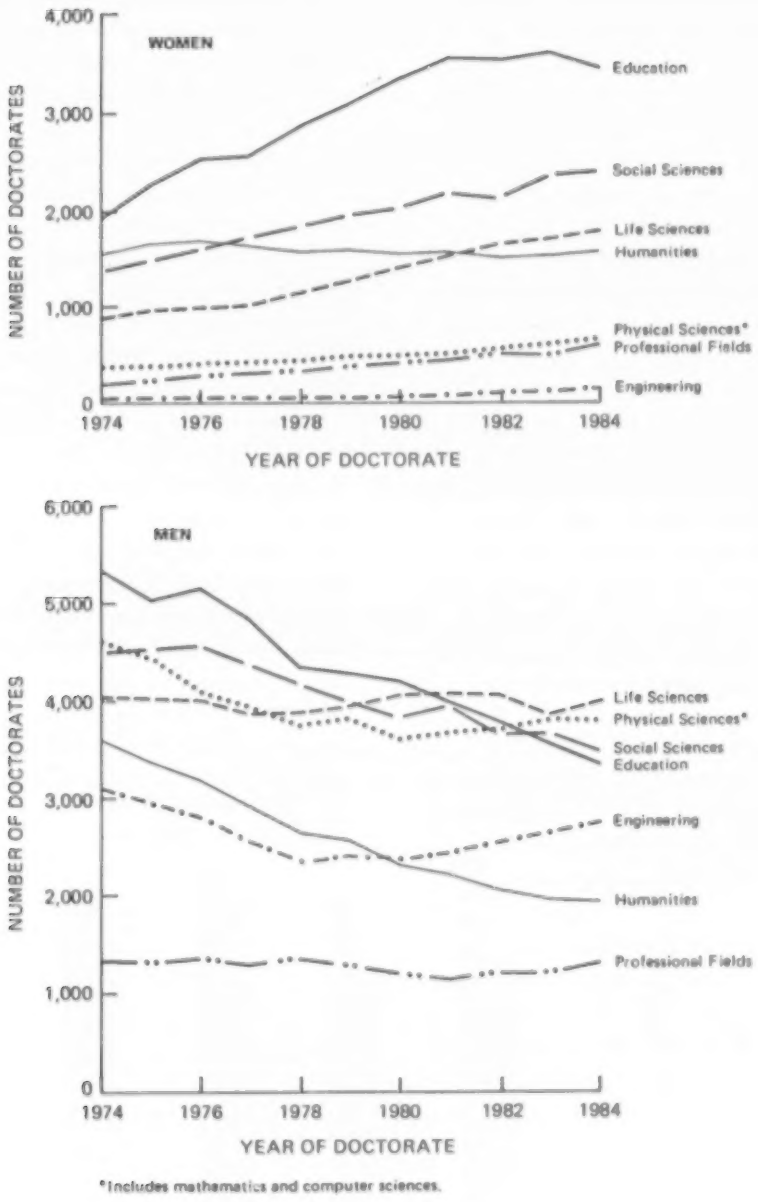

Figure 2 Number of doctorates awarded by U.S. universities by broad field and sex, 1974-1984.

earning doctorate degrees in the social sciences continues to grow, the number of new women doctorates in education declined from 1983 to 1984. However, the number of women in each of the other major fields increased in the last year: their greatest numerical increase was in the professional fields, and the greatest proportional increase was in engineering, which, although a very small field for women, has grown steadily since 1978.

The strong growth in the number of women Ph.D.s over the past 25 years, from 1,042 in 1960 to the current 10,660, is reflected in the four selected fields displayed in Figure 3: health sciences, psychology, languages and literature, and education. In each, the annual number of Ph.D.s received by women now exceeds the number earned by men. Much of the growth in women's share in these fields occurred during the post-1970 period. The most dramatic rise occurred in the health sciences, where the proportion of women Ph.D.s increased from 4 percent in 1960 to the current 58 percent, as the result of both numerical growth in the health science fields such as nursing and in shifts in the gender make-up of audiology and speech pathology, public health, and epidemiology. A similar, though not as pronounced, situation has occurred in psychology, where the shift toward having a majority of women among new Ph.D.s has come from a combination of increasing numbers of women in clinical and counseling fields and of higher proportions of women in fields such as experimental, social, and industrial psychology.

Women have traditionally earned a substantial proportion of the humanities doctorates. The growth in women's representation in the languages and literature category--which includes both English and foreign languages--resulted from increased numbers of women achieving Ph.D.s during the 1960-1975 period, followed by a period in which the number of women doctorates levelled off while the number of men Ph.D.s markedly decreased. Nearly the same pattern occurred in the field of education, where women showed large numerical increases through 1983 while the number of men decreased steadily from 1973 to 1984.

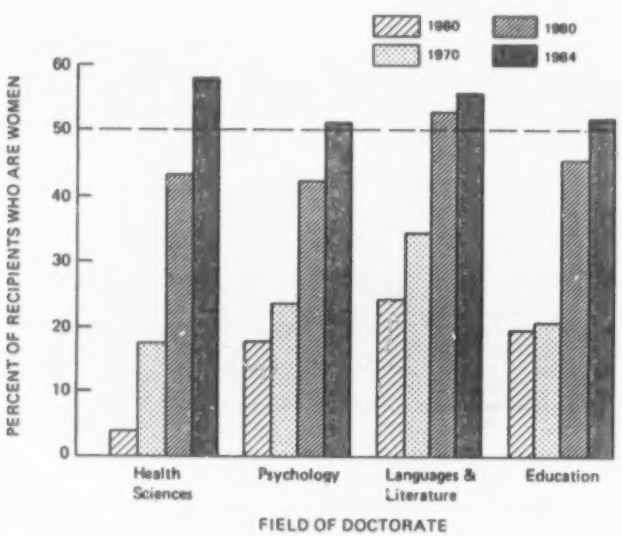

Figure 3 Percent of Ph.D.s who are women, in selected fields, 1960-1984.

Citizenship Status of New Doctorate Recipients

Along with the changing gender distribution among new doctorate recipients has been a continued evolution in the proportions of doctorates earned by non-U.S. citizens over the 1960-1984 period: historically, this proportion grew from 1960 to 1975, was stable from 1975 to 1980, and then increased at roughly a 5 percent annual rate in the 1980s. About one-fifth of all 1984 doctorates were earned by non-U.S. citizens (see Table C). Slightly more than 15 percent of the new Ph.D.s held temporary visas, a proportion that has grown steadily over the past decade. During the same period, the share of permanent visa-holders has remained in the 4-5 percent range.

TABLE C Citizenship Status of Doctorate Recipients, by Field, 1960-1984

	Year of Doctorate					
	1960	1965	1970	1975	1980	1984
Total Doctorates	9733	16340	29498	32951	31017	31253
Total Non-U.S. (%)	12.1	14.2	14.1	15.9	15.9	19.3
Permanent Visa (%)	2.9	3.4	5.3	5.2	4.2	3.9
Temporary Visa (%)	9.2	10.7	8.7	10.7	11.7	15.4
Physical Sciences*	2152	3550	5628	4857	4111	4453
Total Non-U.S. (%)	13.2	14.8	16.4	22.6	22.9	26.7
Permanent Visa (%)	2.9	3.5	6.3	7.2	6.1	4.4
Temporary Visa (%)	10.3	11.3	10.1	15.4	16.7	22.3
Engineering	794	2074	3434	3002	2479	2915
Total Non-U.S. (%)	23.0	22.0	26.2	41.1	46.4	52.9
Permanent Visa (%)	6.8	6.7	12.5	13.9	12.1	9.4
Temporary Visa (%)	16.2	15.4	13.7	27.1	34.3	43.5
Life Sciences	1729	2684	4693	5026	5461	5745
Total Non-U.S. (%)	18.0	22.6	19.0	19.9	17.3	17.6
Permanent Visa (%)	3.2	3.5	5.2	6.2	4.2	3.4
Temporary Visa (%)	14.7	19.0	13.9	13.7	13.1	14.2
Social Sciences	1668	2327	4566	6066	5856	5895
Total Non-U.S. (%)	11.9	13.5	13.6	12.5	11.6	14.0
Permanent Visa (%)	3.0	3.6	4.9	3.5	3.3	3.3
Temporary Visa (%)	8.9	10.0	8.7	9.0	8.3	10.8
Humanities	1600	2530	4278	5046	3867	3528
Total Non-U.S. (%)	5.9	7.5	8.5	8.9	8.8	11.2
Permanent Visa (%)	2.9	2.9	4.7	4.4	3.5	4.1
Temporary Visa (%)	2.9	4.6	3.8	4.5	5.3	7.1
Education	1549	2736	5857	7359	7587	6780
Total Non-U.S. (%)	5.2	5.3	4.7	6.3	8.2	9.8
Permanent Visa (%)	.5	1.0	1.2	1.6	1.5	1.9
Temporary Visa	4.6	4.4	3.4	4.7	6.7	7.9
Professional & Other	241	439	1042	1595	1656	1937
Total Non-U.S. (%)	10.8	16.2	16.6	15.3	15.6	21.0
Permanent Visa (%)	.8	4.3	5.0	5.0	4.0	4.5
Temporary Visa (%)	10.0	11.8	11.6	10.3	11.6	16.4

*Includes mathematics and computer sciences.

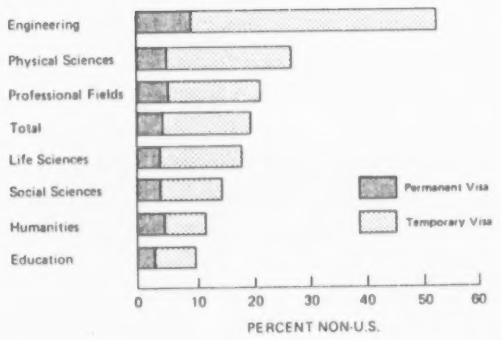

Figure 4 Percent of 1984 doctorate recipients holding non-U.S. citizenship, by field.

Although the overall percentage of foreign doctorate recipients has grown slowly since 1960, the growth in some fields has been quite large (see Table C and Figure 4). Figure 4 reflects the proportional distribution of non-U.S. citizens among fields in 1984: engineering led with nearly twice the proportion of foreign doctorates as the physical sciences, the next largest field. The professional fields also drew more than the average proportion of non-U.S. citizens. Notably, while the proportions of permanent visa-holders are relatively similar across fields, the fractions of temporary visa-holders account for the variations among fields, ranging from 7 percent in humanities to 44 percent in engineering.

By far, the largest proportion of non-U.S. citizens is in engineering, where foreign citizens accounted for more than one-half of the 1984 Ph.D.s. This percentage has doubled since 1970, and during the same period the percent of temporary visa-holders has more than tripled. In contrast, the fraction of engineering Ph.D.s who are permanent visa-holders has declined during the same 15-year period. The recent increase in foreign Ph.D.s in the physical sciences has primarily been in the fields of physics, mathematics, and computer sciences. The leading subfields for foreign citizens in the professional fields, life sciences, and social sciences were business (29 percent non-U.S. in 1984), agriculture (37 percent), and economics (40 percent), respectively.

Racial and Ethnic Status of Doctorate Recipients

Trend data for the past decade on the racial and ethnic status of doctorate recipients who are either U.S. citizens or non-U.S. citizens with permanent visas show that changes in the overall picture between 1975 and 1984 have been modest but positive, with all named minority groups having enhanced their percentage of degrees received (see Table D). In 1975 American Indians earned 0.1 percent of the Ph.D.s; in 1984 they attained 0.3 percent. Asians, who represented 3.7 percent of the recipients in 1975, were 4.1 percent in 1984. Blacks earned 3.9 percent of the Ph.D.s in 1975 and 4.3 percent in 1984. Hispanics have doubled their proportion since 1975, going from 1.2 percent of the degrees earned to 2.5 percent in 1984. The proportion of doctorates received by whites fell slightly from 91.0 percent in 1975 to 88.8 percent in 1984.[1]

American Indians comprise the smallest group of the reported ethnic cohorts: their largest concentration has been in education, the field in which 44 percent received their degrees in 1984. Education has also drawn the largest proportion of Black Ph.D.s--49 percent in 1984. Blacks' next largest concentration is in the social sciences, where 21 percent attained their doctorates in 1984. This pattern is also seen among Hispanics: the largest proportion, 26 percent, earned their degrees in education, and the next largest field was social sciences at 22 percent. Asians tend to choose the natural sciences and engineering more often: in 1984, 43 percent obtained their Ph.D.s in physical and life sciences, and 25 percent got engineering degrees.

TABLE D Racial/Ethnic Status of 1975-1984 Doctorate Recipients Who Are U.S. Citizens or Permanent Visa-Holders, All Fields

	Year of Doctorate									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Reporting Race/Ethnicity	27416	27470	26298	25078	25232	25229	25262	24973	24951	24536
American Indian	36	40	66	60	81	75	85	77	81	73
	0.1*	0.1	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Asian	1025	975	910	1032	1102	1102	1072	1004	1043	1017
	3.7	3.5	3.5	4.1	4.4	4.4	4.2	4.0	4.2	4.1
Black	1057	1149	1194	1106	1114	1106	1110	1143	1004	1049
	3.9	4.2	4.5	4.4	4.4	4.4	4.4	4.6	4.0	4.3
Hispanic	337	363	474	538	539	485	526	614	607	605
	1.2	1.3	1.8	2.1	2.1	1.9	2.1	2.5	2.4	2.5
White	24961	24943	23654	22342	22396	22461	22469	22135	22216	21792
	91.0	90.8	89.9	89.1	88.8	89.0	88.9	88.6	89.0	88.8
Other and Unknown	1379	1293	1189	1557	1552	1283	1078	638	651	631

*Percentage of those reporting racial/ethnic status.

[1] Of the 25,167 U.S. citizens and permanent visa-holders, 24,536--or 97 percent--reported their racial/ethnic status. The proportions reported here are based on this population.

Median Time-to-Ph.D.

The overall trend in time-to-Ph.D. (see Figure 5) shows a trough-shaped curve from 1960 to 1984. The 1960 median of 8.8 years is followed by a decline through the decade to a low value of 7.9 years in 1970; thereafter, the time-to-Ph.D. has risen steadily to its peak of 10.0 years in 1984. This aggregated median, however, obscures some distinct differences among its component parts, e.g., field and gender variations. Since the mid-1960s, the median time for all doctorate recipients in the physical sciences, engineering, life sciences, and social sciences has been lower than these aggregate figures. Meanwhile, the time from bachelor's degree to Ph.D. for individuals in the humanities, professional fields, and education has been longer than that average.

Consistently earning their degrees in the shortest amount of time have been the physical science doctorates. This group took a median 6.5 years in 1960 and then shortened their degree period to a low of 6.0 years in 1966 through 1968; by 1984 the median time-to-Ph.D. for physical scientists was 7.2 years. Consistently taking the longest amount of time have been the recipients of education degrees. In 1960, education doctorates earned their degrees in a median 12.8 years after their B.A.s. That amount of time rose to 14.3 years in 1966 but then declined, staying at about 12 and one-half years throughout the 1970s. In the 1980s, however, educators' median time-to-degree rose a second time and reached a high of 14.6 years in 1984.

In addition to dissimilarities in time-to-degree by recipients in the broad fields, the median time is different for men and women. On the average, women take longer to earn their degrees: in 1984 their median time-to-Ph.D. for all fields was 11.6 years, while men's median time was 9.3 years. When disaggregated by field, the gender differences in time-to-degree change in both direction and scope. In 1984, the overall direction of the gap in two of the seven broad fields was reversed, as women earned their degrees more quickly than men in physical sciences and engineering. In terms of the gap's scope, the sexes were most alike in time spent earning degrees in the physical sciences, where women completed the Ph.D. in 7.0 years, slightly ahead of men's median 7.2 years. Men and women were most dissimilar in the professional fields, where men led women by completing the doctorate in 11.8 versus 13.3 years.

There are large differences between the broad fields reflected in Table E, which shows the median years-to-degree by field and sex, and a number of possible reasons therefor. For example, differential sources of support through the graduate experience may be a factor. Field comparisons show that doctorate recipients in the physical sciences reported the greatest proportion of institutional support through university fellowships, research assistantships, and teaching assistantships and were the Ph.D. recipients earning their degrees in the shortest amount of time. In contrast, education doctorates, who reported the lowest proportion of support from these sources and the greatest from personal sources, had the slowest time-to-degree in 1984.

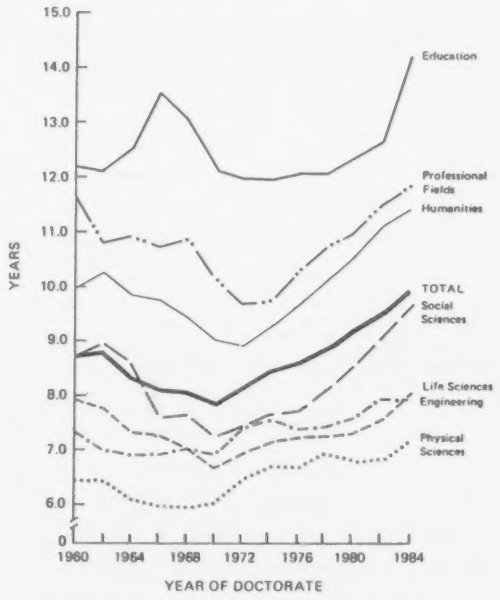

Figure 5 Median total years from receipt of baccalaureate to earning the doctorate, 1960-1984.

TABLE E Median Total Years from Receipt of Baccalaureate to Earning the Doctorate, 1960-1984

Field of Doctorate	Year of Doctorate												
	1960	1962	1964	1966	1968	1970	1972	1974	1976	1978	1980	1982	1984
Total Ph.D.s	8.77	8.83	8.37	8.16	8.11	7.88	8.19	8.51	8.64	8.90	9.27	9.56	10.00
Men	8.54	8.57	8.09	7.91	7.88	7.64	8.00	8.34	8.37	8.55	8.77	8.99	9.31
Women	12.16	12.01	11.92	10.86	10.29	9.63	9.68	9.41	9.72	10.07	10.53	10.99	11.60
Physical Sciences	6.49	6.51	6.18	6.04	6.02	6.11	6.53	6.78	6.74	6.98	6.85	6.89	7.20
Men	6.48	6.53	6.17	6.04	6.00	6.08	6.52	6.79	6.74	7.01	6.88	6.89	7.23
Women	7.08	6.25	6.50	6.17	6.46	6.71	6.65	6.58	6.65	6.77	6.65	6.87	7.05
Engineering	7.36	7.07	6.97	6.99	7.07	6.93	7.46	7.62	7.46	7.50	7.63	7.97	7.99
Men	7.36	7.05	6.97	6.98	7.07	6.92	7.46	7.63	7.46	7.50	7.65	8.00	8.02
Women	12.00	10.00	7.50	7.83	6.50	8.00	7.50	7.00	7.57	7.40	6.58	7.62	7.37
Life Sciences	7.96	7.82	7.40	7.34	7.13	6.63	6.99	7.20	7.28	7.32	7.37	7.61	8.18
Men	7.89	7.73	7.30	7.32	7.15	6.61	6.97	7.22	7.27	7.21	7.26	7.50	8.04
Women	8.91	8.90	8.48	7.50	7.02	6.77	7.10	7.12	7.34	7.83	7.76	7.94	8.51
Social Sciences	8.75	9.02	8.18	7.64	7.70	7.31	7.47	7.72	7.75	8.13	8.59	9.15	9.68
Men	8.62	8.86	8.00	7.45	7.58	7.22	7.35	7.72	7.69	8.05	8.45	8.97	9.56
Women	9.81	10.44	9.70	9.27	8.34	7.85	8.03	7.73	7.94	8.31	8.87	9.54	9.92
Humanities	10.05	10.32	9.91	9.83	9.47	9.07	8.99	9.30	9.70	10.18	10.61	11.16	11.48
Men	9.92	10.06	9.71	9.55	9.26	8.88	8.86	9.21	9.58	9.95	10.29	10.79	11.18
Women	11.67	12.14	11.19	11.08	10.45	9.73	9.44	9.52	9.95	10.53	11.21	11.70	11.94
Education	12.89	12.76	13.50	14.25	13.94	12.68	12.53	12.38	12.65	12.71	13.15	13.60	14.63
Men	12.21	12.31	13.00	13.90	13.33	12.28	12.14	12.14	12.52	12.39	12.87	13.16	14.19
Women	26.61	23.00	28.29	23.75	23.50	14.94	14.45	13.35	13.00	13.31	13.53	14.16	15.09
Professional Fields	11.80	10.84	10.95	10.77	10.92	10.15	9.72	9.79	10.31	10.73	11.05	11.58	12.23
Men	10.63	10.18	10.47	10.05	10.55	9.79	9.27	9.63	10.07	10.45	10.93	11.59	11.78
Women	47.51	20.37	15.50	28.42	19.99	21.63	17.21	12.31	11.27	11.85	11.74	11.56	13.29

Commitments to Business and Industry

The proportion of doctorate recipients with commitments to U.S. business and industry has grown from 1970 to 1984 (see Table F), although the trend has been somewhat irregular. The lowest proportion of commitments (10 percent) occurred in 1972, followed by a rise and then a second, smaller dip four years later (to 12 percent). The high point (22 percent) was reached in 1982, and a small decline appeared in the two years thereafter (to 20 percent). The shape of this irregular trend varies from field to field (Figure 6), which may in part reflect the divergent conditions and demands for professionals among the seven broad disciplines.

The physical sciences field reflects the combined field pattern, although its rises and declines are sharper. Its low proportion of intended business and industry entrants was 22 percent in 1972, and its high was 57 percent in 1982. In 1984, 48 percent of these recipients had commitments to business and industry; these strong proportions appear to result primarily from Ph.D.s in chemistry and computer sciences, who enter industry with some frequency.

A large proportion of engineering doctorates--50 percent or more in 13 of the 15 years from 1970 to 1984--have also made employment commitments to industry. Their lowest proportion was 47 percent in 1971, and the apex reached in 1982 (61 percent) slipped to 52 percent in 1984.

Life scientists have also been moving to business and industry. Like most of the others, their low point (10 percent) was in 1972. In 1982, and again in 1984, the proportion reached 26 percent. Agricultural and health science Ph.D.s are the most likely among life scientists to find employment in the business/industry sector.

Recipients of social science doctorates have been somewhat different, in that their proportionate upward trend toward commitments to industry and business has not experienced any interim declines since their 1971 low of 4 percent. Part of their growth may be explained by the component of clinical and counseling psychologists who are entering private practice.

In the other three broad disciplines of humanities, education, and professional fields, slight year-to-year fluctuations have occurred over the same period. The net flow has been in an upward direction, but in none of the fields has the proportion of commitments made to business employers exceeded 10 percent.

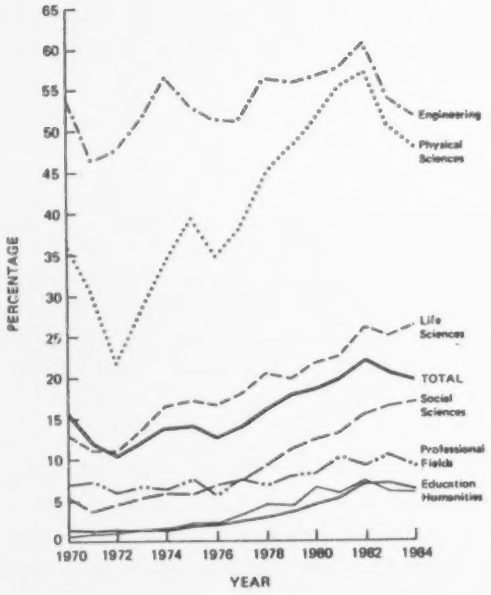

Figure 6 Business and industry commitments as a percentage of total employment commitments, 1970-1984.

TABLE F Doctorate Recipients with Commitments for Employment in U.S. Business and Industry, 1970-1984

Field of Doctorate	Year of Doctorate														
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Ph.D.s	2641	2154	1829	2133	2259	2322	2033	2136	2371	2701	2937	3115	3377	3021	2855
	15.0	11.7	10.1	11.6	13.3	13.5	12.2	13.6	15.7	17.5	18.3	19.5	21.8	20.1	19.6
Physical Sciences	984	745	462	575	637	736	567	632	753	890	942	1056	1094	893	832
	35.7	30.1	21.8	28.8	34.2	39.5	34.8	38.4	44.8	48.0	51.3	55.3	57.1	50.8	48.3
Engineering	1138	920	882	923	923	850	728	712	704	777	795	780	818	708	674
	52.8	46.5	47.5	51.4	56.6	52.9	51.4	51.0	56.5	55.8	56.4	57.6	60.7	53.9	51.9
Life Sciences	240	218	178	248	266	264	244	241	283	273	315	340	393	351	351
	12.9	11.0	10.4	13.7	16.4	16.8	16.3	17.9	20.3	19.4	21.1	22.4	26.3	25.0	26.2
Social Sciences	149	123	149	185	200	210	242	243	294	367	400	447	477	501	500
	5.0	3.6	4.3	5.2	5.9	5.9	7.0	7.4	9.5	11.5	12.6	13.4	15.7	16.4	17.2
Humanities	20	31	37	45	65	60	64	74	103	97	143	124	148	114	107
	0.6	1.0	1.1	1.4	2.3	2.3	2.7	3.4	4.9	4.9	7.1	6.2	7.9	6.3	6.1
Education	64	65	70	88	99	123	125	147	151	201	245	253	338	331	278
	1.6	1.4	1.5	1.8	2.1	2.5	2.5	3.1	3.4	4.5	5.0	5.3	7.4	7.3	6.4
Professional Fields	46	52	51	69	69	79	63	87	83	96	97	115	109	123	113
	6.9	7.1	5.9	6.4	6.2	6.9	5.3	7.6	6.9	8.1	8.3	10.1	9.1	10.4	9.1

BACCALAUREATE SOURCES OF 1984 DOCTORATE RECIPIENTS

The special topic of this report is the baccalaureate sources of doctorate recipients. B.A. institutions are categorized and analyzed by type, roughly along the lines of the Carnegie Classification system, and looked at individually as well. Two kinds of measures are used to analyze B.A. sources: the first measures "output"--that is, the absolute number of Ph.D.s who earned their baccalaureates at a given institution or type of institution, and the second measures "productivity," the ratio of Ph.D.s to the number of B.A. graduates from an institution or institutional type. The output measure is applied in a time series analysis whereby trends in B.A. origins over the 1920-1984 period are examined. Output is also compared to "productivity" of 1984 doctorate recipients. For this, a simple ratio is calculated in order to illustrate comparability between institutional types and individual institutions and to show differences in B.A. sources between men and women and between the whole cohort and minority groups.

The Typology

Currently in the United States, more than 2,000 colleges and universities grant baccalaureate degrees; the 1984 Ph.D. cohort earned their B.A.s from 1,380 U.S. institutions. To handle analytically the large number of institutions, a typology of B.A. institutions was constructed by recasting the Carnegie Classification of Institutions of Higher Education,[2] which categorized institutions on the bases, variously, of federal financial support for the sciences, the numbers and types of degrees awarded and programs offered, the size of enrollment, and the selectivity of admissions.

The present scheme reformulates that classification into five types of institutions, which are further identified as public or private. Type I consists of institutions that Carnegie rated as Research I--the first 50 research and doctorate-granting universities in terms of federal financial support for the sciences and numbers of Ph.D.s awarded annually. Type II merges institutions that Carnegie ranked 1.2 through 1.4--that is, all Other Doctorate-Granting universities. Comprehensive colleges and universities (Carnegie 2.1 and 2.2), which grant M.A.s as their highest degree, comprise Type III. Liberal Arts colleges, which primarily confer bachelor's degrees (the Carnegie 3.1 and 3.2 schools), are Type IV. Type V absorbs the myriad of specialized institutions that Carnegie ranked 5.1 through 5.9, such as teachers colleges, health professional schools, and schools of engineering and technology. While these generalized categorizations are useful, they are not always easily made, for their criteria allow some overlap. A chart followed by a full definition of each institutional category can be found in Appendix B.

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[2] Carnegie Commission on Higher Education, A Classification of Institutions of Higher Education (rev. ed.), Berkeley: The Carnegie Foundation for the Advancement of Teaching, 1976.

Output by B.A. Source Types, 1920-1984

Using the measure of output, a historical look is taken at the B.A. sources in the United States of doctorates earned in the first year of each decade during the 1920 to 1984 period (see Figure 7 and Table G). Proportions are based on the total number of Ph.D.s who received their baccalaureate degrees from each institutional type.

Table G shows both the tremendous growth in the overall number of doctorate recipients and the change in distribution of those individuals among broad institutional categories over the past 65 years: the Research I institutions grew from being the B.A. source of 216 Ph.D.s to being the source of 6,715 of the B.A.s who earned doctorates, the Other Doctorate-Granting institutions went from 110 to 7,015, the Comprehensive group from 62 to 7,025, the Liberal Arts colleges from 113 to 3,390, and the Specialized institutions from 3 to 466.

However, over this growth period two interrelated trends markedly changed the distribution of individuals among institutional categories. In 1920, Research I institutions were the B.A. sources for 43 percent of the doctorates granted, but that percentage began to decrease slowly in the 1930s and more rapidly during the 1960s so that by 1984, only 27 percent of the new Ph.D.s reported B.A.s from Research I institutions. Similarly, the proportionate share for the Liberal Arts colleges declined from 22 percent in 1920 to 14 percent in 1984; this decline, however, was most rapid in the 1920-1950 period, and the share for this category has remained relatively stable since 1960. These percentage declines were not the result of numerical decreases but of the very rapid growth (beginning in 1940) of the public Comprehensive, or master's-degree, institutions that primarily grew out of the state colleges of the 1950s;[3] from 1920 to 1984 their proportional share of baccalaureates earning Ph.D.s mushroomed from 3 to 18 percent. The share of B.A. sources also grew, although to a lesser degree, for the category of public Other Doctorate-Granting institutions, many of which again are the large state-supported institutions.

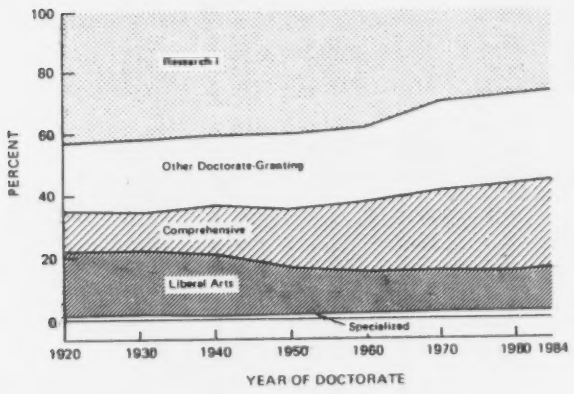

Figure 7 Baccalaureate sources of 1920-1984 doctorate recipients.

A consequence of the rapid growth of the Comprehensive institutions is the second trend, the shift from private institutions to public colleges as the primary B.A. sources (see Table G). Interesting is the almost mirror-image transition from a 60/40 private-public distribution in 1920 (62 percent private, 38 percent public) to a 40/60 private-public balance in 1984 (41 percent private, 59 percent public). The shift from predominately private B.A. sources to public ones occurred during the tremendous surge in graduate education in the years immediately following World War II.

To put the private-public shift in perspective, it would be helpful to know the number of all baccalaureate degrees conferred from each institutional type at appropriate antecedent dates for the Ph.D.s earned in 1920 and 1984. Unfortunately, information

3 The growth of the Comprehensive institutions as baccalaureate sources is well-exemplified by City College of the City University of New York. Among the 10 leading B.A. sources in terms of numbers of B.A.s earning Ph.D.s in 1940, City College was the top B.A. source in both 1950 and 1960, and the third largest source in 1970, accounting for 175, 190, and 339 of the new doctorates in those years respectively. While still an important B.A. source, City College was not one of the 30 leading producers reported in 1984.

on private and public institutional origins is not readily available for the earlier cohort. The U.S. Department of Education's earliest such data are for 1936-37, which can be used as a rough proximate B.A. period for the 1940 doctorates. Data are also available for 1974, the median B.A. year for the 1984 cohort of Ph.D.s.[4] These data shed some light on the trend.

In 1936-37, B.A.s nationally were evenly distributed (50/50) between private and public institutions. However, the 1940 doctorates had a 54/46 split between private and public B.A. sources--that is, 54 percent earned their baccalaureates at private schools, while 46 percent came from public institutions (see Table G). By 1974, the proportion of baccalaureates awarded from private schools had declined to 31 percent, and 69 percent of B.A.s were from public institutions. Yet the 1984 doctorates, whose median B.A. year was 1974, had a 41/59 private to public B.A. source split. Thus, while there has been a historical change in distribution of doctoral antecedents from a majority with private origins to a majority with public institution sources, national data suggest that private institutions are still strong baccalaureate sources for graduates who subsequently earn Ph.D.s.

TABLE G Percentage Distribution of Institutional Types of U. S. Baccalaureate Sources, 1920-1984

		Year of Doctorate							
		1920	1930	1940	1950	1960	1970	1980	1984
Total Doctorates with U.S. B.A.	(N)	505	1865	3052	5836	8544	25253	25786	24655
Total Classified	(N)	504	1865	3052	5832	8529	25220	25754	24611
		99.8	100.0	100.0	99.9	99.8	99.9	99.9	99.8
Research I		42.8	42.2	40.5	39.7	37.5	30.4	27.9	27.2
Public		19.4	23.4	23.2	22.7	20.5	19.0	17.9	18.0
Private		23.4	18.8	17.3	17.0	17.0	11.4	10.0	9.2
Other Doctorate		21.8	23.0	23.2	24.9	25.6	28.5	28.4	28.5
Public		14.5	14.8	15.2	16.3	16.7	19.4	20.5	21.0
Private		7.3	8.2	8.0	8.6	8.9	9.1	7.9	7.4
Comprehensive		12.3	11.9	15.7	19.1	21.1	25.3	28.3	28.5
Public		3.0	4.2	6.8	12.3	12.1	14.5	17.8	18.5
Private		9.3	7.7	8.9	6.8	9.0	10.8	10.5	10.0
Liberal Arts		22.4	21.8	20.0	15.1	14.2	13.5	13.6	13.7
Public		0.2	0.1	0.2	0.0	0.1	0.0	0.1	0.1
Private		22.2	21.7	19.8	15.1	14.1	13.5	13.5	13.6
Specialized		0.6	1.2	0.6	1.2	1.4	2.2	1.8	1.9
Public		0.4	0.3	0.2	0.4	0.5	0.8	0.7	0.8
Private		0.2	0.9	0.4	0.8	0.9	1.4	1.1	1.1
Not Classified		0.2	-	-	0.1	0.2	0.1	0.1	0.2

*Percentage of the total doctorates with U.S. baccalaureates

[4] Biennial Survey of Education 1936-38, U.S. Office of Education, Bulletin No. 42; Earned Degrees Conferred 1972-73 and 1973-74 Summary Data, Tables 3A, 3B, and 3C, National Center for Education Statistics.

Distribution of B.A. Sources by Field

This section looks at the distribution of the five categories of B.A. source institutions across fields by output measure. The first row of Table H reflects this wide distribution while subsequent rows display marked differences among and within the fields in the proportional share of each institutional category. Research I, Other Doctorate-Granting, and Comprehensive institutions each contributed about 28 percent of the 1984 Ph.D. cohort, Liberal Arts colleges contributed 14 percent, and Specialized institutions added 2 percent.

The large field differences were strongly reflected within the physical sciences. Physics and astronomy had a distinctive distribution, with B.A.s highly concentrated among the Research I universities. Quite different, however, was the B.A. source distribution for chemistry, where a much broader variety of institutions produced B.A.s who became doctoral chemists. In fact, chemistry had the highest fraction of Ph.D.s coming from Liberal Arts colleges and the lowest proportion from Research I institutions of all science fields.

Engineering had a pattern different from all other fields in that nearly one-half of doctoral engineers received their B.A.s from Research I institutions. Nearly a third came from Other Doctorate-Granting universities. Specialized institutions accounted for 5 percent of the engineering Ph.D.s, a contribution larger than that made by the

TABLE H Baccalaureate Sources of 1984 Doctorate Recipients, by Institutional Type

Field of Doctorate	Total with U.S. B.A.	Total Classified	Percentage of Total Classified: Research I	Other Doctorate	Comprehensive	Liberal Arts	Specialized	Not Classified
Total All Fields	24655	24611	27.3	28.5	28.5	13.8	1.9	44
Physical Sci., Subtotal	3212	3212	31.3	27.1	25.1	14.2	2.3	0
Physics & Astronomy	767	767	42.8	25.9	18.8	9.4	3.1	0
Chemistry	1373	1373	21.8	28.0	31.8	16.9	1.4	0
Earth, Atmos., & Mar. Sci.	486	486	34.8	27.4	19.8	14.8	3.3	0
Mathematics & Computer Sci.	586	586	35.5	26.3	22.0	13.8	2.4	0
Engineering	1394	1394	47.7	31.0	12.3	3.9	5.0	0
Life Sciences, Subtotal	4670	4661	34.3	31.0	21.4	11.8	1.5	9
Biological Sciences	3353	3349	34.7	29.5	22.0	12.9	0.9	4
Health Sciences	588	587	27.4	31.0	24.2	12.3	5.1	1
Agricultural Sciences	729	725	38.2	37.9	16.3	6.2	1.4	4
Social Sciences, Subtotal	4866	4860	28.2	29.8	26.2	15.2	0.7	6
Psychology	2919	2916	26.2	29.5	27.8	15.8	0.7	3
Economics	472	471	33.3	33.8	19.3	13.2	0.4	1
Anthropology & Sociology	714	712	30.5	28.5	24.6	16.2	0.3	2
Political Science	396	396	30.3	29.0	26.3	12.1	2.3	0
Humanities, Subtotal	3052	3043	24.6	25.6	26.7	20.9	2.2	9
History	559	555	24.0	28.3	26.3	20.2	1.3	4
English & Amer. Lang. & Lit.	657	656	16.2	29.4	31.6	22.3	0.6	1
Foreign Lang. & Lit.	385	384	28.4	23.4	30.2	17.2	0.8	1
Professional Fields	1444	1439	23.8	29.2	30.6	13.5	3.0	5
Education	5999	5984	16.4	27.0	42.1	12.7	1.8	15

Type Vs to any other broad doctorate field and notable because only a minor number of those institutions have engineering programs. The performance of the Type V Specialized institutions in the field of engineering can be noted in field lists, which collapse gender and race categories and are reported in Appendix C.

Along with the social sciences, the life sciences fields reflected the overall wide range of B.A. sources, but their proportion from Research I institutions was somewhat higher than the average 27 percent of 1984. Two fields--the health and agricultural sciences--are notable for the concentrations of their Ph.D.s that came from Other Doctorate-Granting institutions. Moreover, doctorate recipients in agricultural sciences earned their B.A.s from Research I and Other Doctorate-Granting institutions with greater frequency than recipients in all other fields except engineering.

The Liberal Arts colleges were most highly represented among humanities doctorates, with about one-fifth of them having come from that B.A. type. Liberal Arts colleges were a more frequently reported B.A. source than even the Research I universities for doctorates in English and American language and literature, despite the Research Is overshadowing Liberal Arts colleges overall by a margin of 2-1. Education doctorates were more than twice as likely to have come from Comprehensive institutions than from Research I schools (42 percent versus 16 percent, respectively the highest and lowest percentages of any field).

Distribution of B.A. Sources by Gender

The types of B.A. sources of 1984 doctorate recipients showed some differences in output proportions between the sexes, but the differences were not very large. Men were more likely than women to have been educated at Research I, Other Doctorate-Granting, or Specialized institutions, while women were more likely than men to have graduated from Comprehensive universities or Liberal Arts colleges (see Table I).

For example, 28 percent of the men and 25 percent of the women had their B.A. origins in Research I universities. Other Doctorate-Granting institutions graduated 29 percent (the highest proportion) of the men and 27 percent of the women recipients in 1984. The greatest difference was at the Liberal Arts colleges, where nearly 17 percent of the women doctorates received their B.A.s, compared with less than 12 percent of the men.

In terms of private and public institutions, there was fundamentally no gender distinction in the proportion of baccalaureate sources for doctorate recipients. In 1984, 58.9 percent of men Ph.D.s received their bachelor's degrees from public institutions, and 40.9 percent graduated from private schools. Public institutions conferred B.A.s to 58 percent of the women doctorates, and private colleges awarded degrees to the other 41.9 percent.

TABLE I Percentage Distribution of Institutional Types of U. S. Baccalaureate Sources of 1984 Doctorate Recipients, by Sex

	Total	Men	Women
Total Doctorates with U.S. B.A. (N)	24655	15285	9370
Total Classified (N)	24611	15256	9355
	99.8	99.8	99.8
Research I	27.2	28.4	25.3
Public	18.0	18.5	17.3
Private	9.2	9.9	8.0
Other Doctorate	28.5	29.3	27.2
Public	21.0	21.6	20.2
Private	7.4	7.7	7.0
Comprehensive	28.5	28.0	29.2
Public	18.5	17.7	19.7
Private	10.0	10.3	9.5
Liberal Arts	13.7	11.8	16.9
Public	0.1	0.1	0.1
Private	13.6	11.7	16.8
Specialized	1.9	2.2	1.3
Public	0.8	0.9	0.7
Private	1.1	1.3	0.6
Not Classified	0.2	0.2	0.2

Distribution of B.A. Sources by Racial/Ethnic Status

When disaggregated by racial/ethnic group, the output distribution of B.A. sources changed radically, except among the white cohort (see Table J).

The Comprehensive, or master's degree level, institution stood out as the major source of B.A. degrees for American Indian, Black, and Hispanic doctorate recipients, having conferred 45.2, 49.2, and 48.2 percent of their degrees, respectively. All of these shares were much greater than the combined average of 28.5 percent from the Comprehensive type. The second greatest baccalaureate source was the Other Doctorate-Granting type of university, which granted B.A.s to 31.5 percent of American Indian Ph.D.s, 3 points higher than the combined average proportion. The Other Doctorate-Granting university was also the second largest source for Black and Hispanic doctorate recipients, although the respective 18.2 percent and 21.2 percent shares were below that of the combined average, suggesting its possibly lesser significance as a type of B.A. school for these two groups.

On average, Specialized institutions contributed 1.9 percent of the Ph.D.s; comparatively, they were a disproportionately large source of B.A.s for one group--American Indians, for which they comprised 4.1 percent of the B.A. sources. Given Liberal Arts colleges' combined average B.A. source share of 13.7 percent, they were a disproportionately large source for one group: for Black recipients they comprised 16.9 percent of the baccalaureate origins. For Hispanics the proportion of Other Doctorate-Granting institutions was nearly matched by that of the Research I universities (20.5 percent).

Doctorate recipients of Asian ethnicity differed in their B.A. sources both from the combined average proportions and from the other minority groups. The majority of Asian Ph.D.s received their baccalaureate degrees from Research I universities--48.4 percent, a share which put this group at greatest variance with the combined B.A. source proportion by being more than 21 points higher than the 27.2 percent average. With the exception of the Specialized institutions, all other types of B.A. origins were represented more sparsely among the Asian group than they were for the combined average.

TABLE J Percentage Distribution of Institutional Types of U. S. Baccalaureate Sources of 1984 Doctorate Recipients, by Racial/Ethnic Status

	Total	American Indian	Asian	Black	Hispanic	White
Total with U.S. Baccalaureate (N)	24655	73	574	1140	556	21265
Total Classified (N)	24611	73	571	1138	551	21231
	99.8	100.0	99.5	99.8	99.8	99.8
Research I	27.2	15.1	48.4	13.9	20.5	27.2
Public	18.0	12.7	31.9	7.7	14.6	18.2
Private	9.2	2.7	16.7	6.2	5.9	9.0
Other Doctorate	28.5	31.5	21.8	18.2	21.2	29.5
Public	18.0	27.4	16.0	11.8	14.7	22.0
Private	9.2	4.1	5.7	6.3	6.5	7.5
Comprehensive	28.5	45.2	15.7	49.2	48.2	27.4
Public	18.0	34.2	11.7	36.5	37.4	17.3
Private	9.2	11.0	4.0	12.7	10.8	10.1
Liberal Arts	13.7	4.1	11.7	16.9	8.8	13.8
Public	18.0	0.0	0.2	0.7	0.0	0.1
Private	9.2	4.1	11.5	16.2	8.8	13.7
Specialized	1.9	4.1	1.9	1.6	1.1	1.9
Public	18.0	4.1	1.2	0.8	1.1	0.8
Private	9.2	0.0	0.7	0.8	0.0	1.1
Not Classified	0.2	0.0	0.5	0.2	0.2	0.2

"Productivity" of B.A. Sources of 1984 Ph.D.s

As mentioned earlier, there is more than one way to consider which schools are leaders in producing doctorate earners. For some investigators, the appropriate measure is an institution's "output," that is, the absolute number of Ph.D.s that its graduates ultimately earn.[5] A disadvantage to such an approach is that large degree-granting institutions will dominate the field by sheer size of graduating classes with the potential to earn the doctorate. Public institutions will rank more highly in output because they graduate more persons than do their privately controlled counterparts (as noted earlier, 69 percent of the B.A.s in 1974 were conferred at public institutions).

5 See, for example, Lindsey Harmon and Herbert Soldz, Doctorate Production in United States Universities, 1920-62, National Academy of Sciences: Washington, D.C., 1963.

One way to normalize the Ph.D. output measure among schools is to introduce a ratio that divides the number of an institution's graduates who earn doctorates by the institution's total graduate number. The percentage that results, called Ph.D. "productivity," is particularly useful not only for controlling for the scale effects of institutional size, but also for comparing baccalaureate sources for gender or racial groups. To illustrate such applications--and not to suggest a standard--a "productivity" ratio implemented here puts the 1984 Ph.D.s into the numerator and the 1974 B.A.s into the denominator.[6] A 10-year lag from 1974 was selected because in 1984 the median time from bachelor's to doctorate was 10.0 years, all fields combined. This lag does ignore the considerable variation in length of time-to-degree that is apparent when the data are disaggregated by field, sex, and ethnic group. In addition, the use of a particular set of years--1984 for Ph.D.s and 1974 for B.A.s--could produce results that reflect particular idiosyncratic conditions prevalent in those years. While such anomalies may be reflected in lists that rank individual institutions by their Ph.D. "productivity," they are not likely to arise in lists ranking the institutional types.

Both such kinds of "top producers" lists were generated for this report, a ranked type list and a ranked individual list. The institutional types ranged in their "productivity" from a high of about one Ph.D. out of every 10 graduates in 1974 (10 percent) to a low of about one doctorate out of every 70 grads (1.4 percent). The mean Ph.D. "productivity" of U.S. institutions of higher education in 1974 was 2.8 percent, a ratio of one out of 36 students, with a standard deviation of 2.8 percent. The median was lower, at 2.1 percent, in a distribution skewed to the right. Individual institutions ranged widely in their Ph.D. "productivity," from 71 Ph.D.s out of 195 B.A.s (36.4 percent) to a low of one Ph.D. out of 1,228 graduates (0.08 percent).

To reduce the impact of snapshot irregularities on the ranked individual list, a size criterion was introduced: an institution had to have graduated 50 or more students in 1974, since numbers smaller than 50 would tend to produce unreliably high Ph.D. "productivity" ratios--that is, if a small institution granted 10 B.A.s in 1974, and one graduate earned a Ph.D. in 1984, that institution's Ph.D. "productivity" would be one out of 10, or 10 percent, well above the institutional "average" of 2.8 percent reported here. While all schools in a snapshot-type of analysis are subject to such over- (or under-) statement, institutions with denominators under 50 suffer stronger effects of anomalies here. The number of institutions deleted for small denominators was 59; on the ranked type list, this deletion process may have adversely affected the ordering of Type V institutions, which made up three-quarters of the excised group.

The selected lag time and snapshot years introduce a possible lack of reliability that other researchers may want to ameliorate; calculating the various lags appropriate to each field and group requires an investment of resources beyond the scope of this report. Similarly, collection of baccalaureate data to span a period of years rather than a single year requires extra resources that cannot be offered here, although other researchers in the field of baccalaureate origins have implemented

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[6] Data on bachelor's degrees conferred were obtained for 1,296, or 94 percent, of the 1,380 U.S. B.A. institutions reported by the 1984 doctorate recipients. Of the 1,296 institutions, 60 were dropped from further analysis: 59 because of their small size, and one because its nontraditional program did not lend itself to the typology used here. Undergraduate degree information was obtained from the National Center for Education Statistics (NCES), U.S. Department of Education.

ratios framed within longer time periods in which degrees have been awarded.[7] For example, Hardy (1974) developed a formula for doctorates earned between 1920-1939 and 1950-1961, selecting 1917-1936 and 1947-1958 as the corresponding baccalaureate periods and including a weight for the proportion of female to male doctorates, which is not useable in the situation of single-sex institutions. Tidball and Kistiakowsky (1976) were the first to develop output and "productivity" ratios for women and for men separately: based on the actual numbers of B.A.s from 1910 to 1969 who subsequently received Ph.D.s in each of five major fields from 1920-1973, 137 institutions were selected on the bases of large numbers or large percentages of graduates who received the doctorate. While appropriate for comparing individual institutions, such selection is not appropriate to compare Ph.D. "productivity" by institutional type, as here. Brazziel (1983) calculated ratios for the baccalaureate institutions that conferred degrees in 1968-1970 to 25 or more Blacks who then earned doctorates in 1978-1980: he selected a 10-year lag to reflect the 1978-1980 average time-to-degree for Ph.D.s in humanities, social sciences, and education, fields in which Blacks were well-represented. Again, such narrowing is not appropriate here. Hall (1984a) assumed a 4-year lag when constructing indices for the 100 institutions most productive in terms of gross numbers of subsequent Ph.D.s: he divided both doctorate recipients by enrollment numbers and the number of Ph.D.s from 1920-1980 by the B.A. graduate numbers averaged over 13 time periods from 1923-1976. But the 4-year lag is inappropriately short, even when applied strictly to Ph.D.s in chemistry (1984b), as he did later. Fuller calculated Ph.D. "productivity" on the basis of the average number of baccalaureates awarded 1946-1976 and the average number of Ph.D.s earned by graduates of all accredited institutions 1951-1980; she also included a calculation for Ph.D. "productivity" by doctorate field. Brazziel, Hall, and Fuller all constructed ratios that combined men and women students. Finally Tidball (1986) calculated, for women and men separately, and for eight institutional types, the proportion of B.A.s from 288 institutions graduating between 1970 and 1979 who subsequently received the doctorate in one of the natural sciences through 1983.

Output vs. "Productivity"

While the ratio of 1984 Ph.D.s to 1974 graduates is a simple one that may not prove strictly reliable, its purpose is to permit comparisons of schools of different sizes. Table K presents a ranking of the institutional types by both of the

TABLE K Rankings of B.A. Institutional Types, by Output and "Productivity" (Gender and Ethnic Groups Combined)

Output		"Productivity"	
Type	N	Type	n/N
II, Public	5,186	I, Private	2,267/22,367
III, Public	4,555	II, Private	1,829/42,592
I, Public	4,448	I, Public	4,448/121,466
IV, Private	3,359	IV, Private	3,359/93,032
III, Private	2,470	IV, Public	31/1,099
I, Private	2,267	II, Public	5,186/185,841
II, Private	1,829	III, Private	2,470/99,605
V, Private	264	V, Public	202/9,121
V, Public	202	V, Private	264/12,442
IV, Public	31	III, Public	4,555/322,857

[7] Kenneth R. Hardy, "Social Origins of American Scientists and Scholars," Science, 185:497-506, August 1974; M. Elizabeth Tidball and Vera Kistiakowsky, "Baccalaureate Origins of American Scientists and Scholars," Science, 193:646-652, August 1976; William F. Brazziel, "Baccalaureate College of Origin of Black Doctorate Recipients," Journal of Negro Education, 52:102-109, Spring 1983; Alfred E. Hall, "Starting at the Beginning--The Baccalaureate Origins of Doctorate Recipients, 1920-1980," Change, 40-43, April 1984a, and "Baccalaureate Origins of Doctorate Recipients in Chemistry," Change, 47-49, September 1984b; Carol Fuller, "An Analysis of Leading Undergraduate Sources of Ph.D.s, Adjusted for Institutional Size," a report prepared for the Great Lakes Colleges Association, June 1985; M. Elizabeth Tidball, "Baccalaureate Origins of Recent Natural Science Doctorates," Journal of Higher Education, 57 (in press), 1986.

measures discussed. The first list, under the heading of "Output," ranks institutional types on the basis of the numbers (n) of 1984 Ph.D.s who had their baccalaureate origins at each type. The second list, under the heading of "Productivity," ranks institutional types on the basis of the ratio of 1984 Ph.D.s to 1974 B.A. graduates (n/N). The ranked output list is topped by the public Type IIs--Other Doctorate-Granting institutions, which were sixth on the list that measured "productivity" of Ph.D.s by their ratio to B.A.s. The "productivity" list was headed by the private Research I universities (Type I), which, conversely, were sixth on the output list.

Table L lists individual institutions by output and by "productivity." Ranked are the 30 B.A.

TABLE L Thirty Leading B.A. Sources of 1984 Doctorate Recipients, of Schools that Granted 50 or More Baccalaureates in 1974 (Gender and Ethnic Groups Combined)

Output			"Productivity"		
Institution*	n	Type**	Institution*	n/N	Type**
Univ of California-Berkeley	364	I, Public	California Institute of Tech	71/195	I, Private
University of Michigan	307	I, Public	Harvey Mudd College/CA	24/71	IV, Private
University of Illinois	267	I, Public	Reed College/OR	43/205	IV, Private
Univ of California-Los Angeles	253	I, Public	University of Chicago/IL	87/446	I, Private
University of Wisconsin	242	I, Public	Swarthmore College/PA	53/280	IV, Private
Pennsylvania State University	224	I, Public	Massachusetts Institute Tech	200/1065	I, Private
Cornell University/NY	217	I, Private	Haverford College/PA	27/162	IV, Private
Ohio State University	207	I, Public	Oberlin College/OH	95/623	IV, Private
Michigan State University	202	I, Public	Kalamazoo College/MI	32/218	IV, Private
Massachusetts Institute Tech	200	I, Private	Harvard University/MA	157/1122	I, Private
University of Texas-Austin	197	I, Public	Carleton College/MN	46/333	IV, Private
University of Maryland	192	I, Public	Brandeis University/MA	73/531	II, Private
University of Minnesota	189	I, Public	Princeton University/NJ	127/936	I, Private
University of Washington	168	I, Public	Cornell University/NY	217/1616	I, Private
Rutgers, The State University	166	II, Public	Pomona College/CA	44/331	IV, Private
Harvard University/MA	157	I, Private	Barnard College/NY	66/497	IV, Private
Stanford University/CA	156	I, Private	Bryn Mawr College/PA	28/211	IV, Private
Indiana University	149	II, Public	Wellesley College/MA	60/467	IV, Private
SUNY-Buffalo	145	II, Public	St. Mary's Seminary & Univ/MD	6/51	IV, Private
University of Pennsylvania	144	I, Private	Wesleyan University/CT	46/392	IV, Private
CUNY-Brooklyn	140	III, Public	New College/FL***	17/147	IV, Private
Purdue University/IN	138	I, Public	Amherst College/MA	35/309	IV, Private
University of Massachusetts	135	II, Public	Brown University/RI	111/1012	II, Private
Brigham Young University/UT	132	II, Private	Rice University/TX	68/650	II, Private
University of Missouri	132	I, Public	Point Loma College/CA	13/126	III, Private
Univ California-Santa Barbara	130	II, Public	Yale University/CT	124/1237	I, Private
Princeton University/NJ	127	I, Private	Williams College/MA	37/372	IV, Private
University of Colorado	125	I, Public	University of Rochester/NY	116/1171	I, Private
University of Florida	125	I, Public	Grinnell College/IA	30/303	IV, Private
Yale University/CT	124	I, Private	New England Conserv Music/MA	5/52	V, Private

* Named institutions refer to main campuses, unless otherwise noted.

** Type Legend:
I=Type I
II=Type II
III=Type III
IV=Type IV
V=Type V

*** New College has since affiliated with the University of South Florida and today is a public Other Doctorate-Granting institution.

institutions that were the "top producers" of the 1984 cohort of doctorate recipients, both sexes and all ethnic groups combined. As in Table K, two columns show absolute numbers (n) and ratios (n/N), while two other columns indicate the types of institution that these individual producers are. Appendix C presents similar tables of doctorates by each of the seven broad fields.

The Table L output list shows that 8 out of 30 top producers were private schools, whereas all 30 institutions on the "productivity" list were private. Under output ranking, 23 of the 30 top producers were Research I institutions, 6 were Other Doctorate-Granting, and 1 was a Comprehensive. On the other hand, the "productivity" list included representatives from all five of the institutional types: 8 Research Is, 3 Other Doctorate-Granting universities, 1 Comprehensive, 17 Liberal Arts colleges, and 1 Specialized institution. Even with the greater assortment of B.A. types under "productivity," the list is still skewed: when the expected and the observed numbers of institutional types among a group of 30 are compared, a chi-square test of significance (alpha=.01) indicates that Type I schools--the Research I institutions--are significantly overrepresented in the table, and the Comprehensive colleges and universities--Type III--are significantly underrepresented.

The Research I schools have in place extensive graduate programs whose research scholarship and resources may overlap into baccalaureate education; these universities proportionately outrank the other types not only in the overall Ph.D. list but also in many of the field lists of Appendix C. These field lists, which again collapse the gender and race categories and report only the "top" 10 institutions for each major field, also show the strong performance of another type of school: the Specialized institutions, which are overrepresented in engineering and in the humanities (the latter primarily through the discipline of music).

To iterate, the measure of Ph.D. "productivity" used here--the ratio of 1984 Ph.D.s to 1974 graduates--is not meaningful in the sense of producing strictly replicable results. That is, year to year variations can occur that would affect the ratios reported here and perhaps change the list of "top producers." But, in addition to the institutional size comparison, two other comparisons are permissible by the exercise: construction of the "productivity" ratio allows one to point out gender differences in baccalaureate origins and to point out ethnic differences as well.

"Productivity" of B.A. Sources by Gender

From the data already described, Ph.D. "productivity" for each of the sexes can be calculated--that is, the denominator can encompass the total number of male or female graduates from a given institution, and the numerator can consist of the number who subsequently attained the Ph.D. Again to weed out small numbers in the denominator, institutions that granted fewer than 25 degrees to a gender group have been eliminated. The results provide a useful look at how U.S. universities compare in promoting achievement by either sex. Tables M and N show, respectively, the 30 institutions that were B.A. sources to the greatest number of men and women Ph.D.s in 1984 (the output list) and the 30 undergraduate institutions that in 1974 graduated the greatest proportion of men and women who earned doctorates in 1984 (the "productivity" list).

Twenty-seven institutions on the men's output list duplicate those on the overall output roster. In contrast, 21 schools from Table L's output list match the women's top producers (31 listed because of tie). Furthermore, 20 institutions on the men's "productivity" list, and 20 universities on the women's "productivity" list also appear on the overall roster of Ph.D. "productivity." The women's output list has more private institutions than the men's: of the 30 top producers, 9 of the women's and

7 of the men's were private schools. Both sexes' "productivity" lists are dominated by private institutions, the men's list having 28 and the women's having a full 30. On both of the "productivity" rosters, Type I institutions are overrepresented and Type IIIs are underrepresented. The women's output list has on it three women's colleges--Barnard, Wellesley, and Smith. Their "productivity" list also includes three women's colleges--Barnard, Wellesley, and Bryn Mawr.

While 18 institutions appear on both the men's and the women's output lists, no more than 11 institutions appear on both sexes' "productivity" lists--and only about half of them had roughly similar "productivity" rates for women and men. This outcome underscores the problem of calculating "top producers" lists that assume that men and women have the same educational experience.

TABLE M Thirty Leading B.A. Sources of 1984 Men Doctorate Recipients, of Schools that Granted 25 or More Baccalaureates to Men in 1974

Output			"Productivity"		
Institution*	n	Type**	Institution*	n/N	Type**
Univ of California-Berkeley	235	I, Public	California Institute of Tech	69/171	I, Private
University of Michigan	189	I, Public	Harvey Mudd College/CA	21/66	IV, Private
University of Illinois	183	I, Public	University of Chicago/IL	56/260	I, Private
Massachusetts Institute Tech	174	I, Private	Reed College/OR	27/126	IV, Private
University of Wisconsin	156	I, Public	New England Conserv Music/MA	5/25	V, Private
Univ of California-Los Angeles	152	I, Public	Swarthmore College/PA	30/158	IV, Private
Pennsylvania State University	151	I, Public	Kalamazoo College/MI	22/116	IV, Private
Cornell University/NY	142	I, Private	Carleton College/MN	32/172	IV, Private
Harvard University/MA	134	I, Private	Covenant College/TN	6/33	IV, Private
University of Minnesota	130	I, Public	Massachusetts Institute Tech	174/964	I, Private
Michigan State University	125	I, Public	Bethel College/KS	5/30	IV, Private
University of Maryland	118	I, Public	Haverford College/PA	27/162	IV, Private
Ohio State University	114	I, Public	Washington College/MD	10/62	IV, Private
Brigham Young University	113	II, Private	Point Loma College/CA	7/47	III, Private
University of Washington	107	I, Public	Westminster Choir C/NJ	6/42	V, Private
Rutgers, The State University	104	II, Public	Oberlin College/OH	47/332	IV, Private
University of Texas-Austin	104	I, Public	Pomona College/CA	24/175	IV, Private
Purdue University/IN	102	I, Public	Grinnell College/IA	20/146	IV, Private
Princeton University/NJ	99	I, Private	Lebanon Valley College/PA	15/113	IV, Private
Yale University/CT	98	I, Private	Princeton University/NJ	99/752	I, Private
University of California-Davis	92	I, Public	Cornell University/NY	142/1179	I, Private
Indiana University	87	II, Public	Wesleyan University/CT	33/276	IV, Private
University of Massachusetts	86	II, Public	Harvard University/MA	134/1122	I, Private
University of Missouri	86	I, Public	St. Mary's Seminary & Univ/MD	6/51	IV, Private
Stanford University/CA	86	I, Private	Univ of California-Santa Cruz	58/498	II, Public
SUNY-Stony Brook	84	II, Public	New College/FL***	9/78	IV, Private
University of Florida	83	I, Public	Univ of California-San Diego	67/582	I, Public
SUNY-Buffalo	83	II, Public	Nyack College/NY	4/36	IV, Private
Univ California-Santa Barbara	75	II, Public	Drew University/NJ	16/145	IV, Private
University of North Carolina	74	I, Public	Eastern Nazarene College/MA	8/73	IV, Private

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TABLE N Thirty Leading B.A. Sources of 1984 Women Doctorate Recipients, of Schools that Granted 25 or More Baccalaureates to Women in 1974

Output			"Productivity"		
Institution*	n	Type**	Institution*	n/N	Type**
Univ of California-Berkeley	129	I, Public	Dartmouth College/NH	10/26	II, Private
University of Michigan	118	I, Public	Massachusetts Institute Tech	26/101	I, Private
Univ of California-Los Angeles	101	I, Public	Bowdoin College/ME	6/27	IV, Private
Ohio State University	93	I, Public	Reed College/OR	16/79	IV, Private
University of Texas-Austin	93	I, Public	Swarthmore College/PA	23/122	IV, Private
University of Wisconsin	86	I, Public	Brandeis University/MA	46/249	II, Private
University of Illinois	84	I, Public	Cornell University/NY	75/437	I, Private
CUNY-Brooklyn	83	III, Public	Johns Hopkins University/MD	17/102	I, Private
Michigan State University	77	I, Public	University of Chicago/IL	31/186	I, Private
Cornell University/NY	75	I, Private	Oberlin College/OH	48/291	IV, Private
University of Maryland	74	I, Public	Princeton University/NJ	28/184	I, Private
Pennsylvania State University	73	I, Public	Rice University/TX	20/145	II, Private
University of Pennsylvania	72	I, Private	Williams College/MA	7/52	IV, Private
Stanford University/CA	70	I, Private	Barnard College/NY	66/497	IV, Private
Boston University/MA	67	I, Private	Brown University/RI	39/301	II, Private
Barnard College/NY	66	IV, Private	Wellesley College/MA	60/497	IV, Private
University of Colorado	63	I, Public	Pomona College/CA	20/156	IV, Private
Indiana University	62	II, Public	Bryn Mawr College/PA	27/211	IV, Private
Rutgers, The State University	62	II, Public	New College/FL***	8/69	IV, Private
SUNY-Buffalo	62	II, Public	Wesleyan University/CT	13/116	IV, Private
University of Washington	61	I, Public	Sarah Lawrence College/NY	19/170	IV, Private
Wellesley College/MA	60	IV, Private	Gettsyburg College/PA	13/125	III, Private
University of Minnesota	59	I, Public	Hampshire College/MA	8/77	IV, Private
CUNY-Queens	58	III, Public	Stanford University/CA	70/700	I, Private
Northwestern University/IL	56	I, Private	Kalamazoo College/MI	10/102	IV, Private
Univ California-Santa Barbara	55	II, Public	Yale University/CT	26/267	I, Private
CUNY-Hunter	52	III, Public	Phillips University/OK	8/83	IV, Private
University of Pittsburgh	52	I, Public	University of Rochester/NY	48/503	I, Private
Syracuse University/NY	51	II, Private	Northwestern University/IL	56/607	I, Private
Florida State University	50	II, Public	Vassar College/NY	30/330	IV, Private
Smith College/MA	50	IV, Private			

* Named institutions refer to main campuses, unless otherwise noted.

** Type Legend:
I=Type I
II=Type II
III=Type III
IV=Type IV
V=Type V

*** New College has since affiliated with the University of South Florida and today is a public Other Doctorate-Granting institution.

"Productivity" of B.A. Sources by Racial/Ethnic Status

Unfortunately, Ph.D. "productivity" of minority groups cannot be calculated in the same way as "productivity" of gender groups because the racial/ethnic data are not available for the 1974 B.A.s. Instead, ratios have been devised that account for 1984 ethnic group member Ph.D.s, divided by the whole total of B.A. graduates. Such ratios were calculated for B.A. sources of Asians, Blacks, and Hispanics (see Table O), but not for American Indians because their number (73) was not large enough for meaningful comparative ratios. Because the numbers of these groups were not very large, only 10 "top producers" are shown here instead of the 30 that were listed in the overall rosters and in the lists for women and men.

Although ethnic Asian Ph.D.s were more like the majority of degree earners in their top baccalaureate producers than were the other two minority groups, their profile was distinctive. Notably, all of their top B.A. output sources were Research I universities. Top "productivity" B.A. schools for Asian doctorates were predominately Liberal Arts colleges. Seven institutions on their output list appear on the top 30 overall Ph.D. output list, and five schools on their "productivity" list appear on the overall Ph.D. "productivity" list.

The B.A. experience for Black Ph.D.s seems even more unlike the average. Top output institutions for Blacks were likely to be Comprehensive, or Type III, schools (7 out of 10). Top "productivity" schools were likely to be Liberal Arts, or Type IV, colleges (7 out of 10). None of the institutions on either list appear on the overall Ph.D. "top producers" lists (Table L); instead, all 10 of the leading Black B.A. sources ranked by output, and all 10 ranked by "productivity," were traditionally Black institutions.[8] In the mid-1970s, two-thirds of the Blacks who earned bachelor's degrees in the United States graduated from "majority" institutions. Yet, traditionally Black colleges are the ones visible for having educated the Black men and women who went on to become doctorate scholars. In part this may be because denominators of traditionally Black schools are composed mostly of Black students, whereas denominators of majority schools contain large numbers of non-Black students that dilute their ratios for Black Ph.D.s.

Finally, top B.A. producers are ranked for Hispanic doctorate recipients. Three of the schools in the Hispanic output list--all Type I institutions--also appear on the overall top 30 output list. Half of the schools on the output list are Comprehensives (Type IIIs). One of the leading Hispanic B.A. sources by "productivity", a Liberal Arts college, appears on the overall "productivity" list. Three Liberal Arts colleges appear on the "productivity" list, and six others are Type IIIs. By either measure, the geographic distribution is striking: Southern, Western, and Puerto Rican B.A. institutions were the greatest producers of the Hispanic cohort of 1984 Ph.D.s on the output list: the first and second top producers are located in Puerto Rico while the others are located in Texas (2), California (2), Florida (2), Colorado (1), and New Mexico (1). As measured by "productivity," three Puerto Rican institutions ranked among the top 10 list, and the remainder were from Western States, with the exception of Edgewood College (Wisconsin).

When top producers are compared between minority groups and the overall Ph.D. population in the U.S., several distinctions can be made. For output of the Asian group, the Type I institutions (Research I) figure exclusively in the top 10. The Comprehensive, master's-degree level, type of institution, becomes quite significant as a B.A. source among Black and Hispanic doctorate recipients, especially

[8] Traditionally Black institutions have been identified by the National Center for Education Statistics in conjunction with a panel of experts on Black colleges and universities in Traditionally Black Institutions of Higher Education, Washington, D.C.: U.S. Government Printing Office, 1978.

TABLE O Leading B.A. Sources of 1984 Minority Group Doctorate Recipients

Output			"Productivity"		
Institution*	n	Type**	Institution*	n/N	Type**
Asians					
Univ of California-Berkeley	40	I, Public	California Institute of Tech	11/195	I, Public
University of Hawaii	28	I, Public	Bethel College/KS	1/64	IV, Private
Univ of California-Los Angeles	25	I, Public	Massachusetts Institute Tech	16/1065	I, Public
Massachusetts Institute Tech	16	I, Private	Reed College/OR	3/205	IV, Private
University of Wisconsin	14	I, Public	Harvey Mudd College/CA	1/71	IV, Private
University of California-Davis	12	I, Public	SUNY-Downstate Medical Ctr	2/151	V, Public
California Institute of Tech	11	I, Private	Mobile College/AL	1/93	IV, Private
Cornell University/NY	11	I, Private	Atlantic Union College/MA	1/100	IV, Private
Princeton University/NJ	10	I, Private	Albertus Magnus College/CT	1/110	IV, Private
Stanford University/CA	10	I, Private	Pomona College/CA	3/331	IV, Private
Blacks					
Howard University/DC	31	II, Private	Fisk University/TN	17/275	IV, Private
Morgan State College/MD	23	III, Public	Bennett College/NC	4/72	IV, Private
Tennessee State University	20	III, Public	Spelman College/GA	12/219	IV, Private
Hampton University/VA	19	III, Private	Morehouse College/GA	10/183	IV, Private
Tuskegee Institute/AL	18	III, Private	Tougaloo College/MS	7/162	IV, Private
Fisk University/TN	17	IV, Private	Lincoln University/PA	7/172	IV, Public
North Carolina Central Univ	14	III, Public	Hampton University/VA	19/484	III, Private
North Carolina Ag & Tech	13	III, Public	Wiley College/TX	3/79	IV, Private
Jackson State University/MS	12	III, Public	Tuskegee Institute/AL	18/182	III, Private
Spelman College/GA	12	IV, Private	Clark College/GA	6/172	III, Private
Hispanics					
Univ Puerto Rico-Rio Piedras	58	III, Public	Univ of Sacred Heart/PR	3/110	III, Private
Univ Puerto Rico-Mayaguez	18	III, Public	Reed College/OR	4/205	IV, Private
University of Texas-Austin	17	I, Public	Adams State College/CO	8/420	III, Public
Adams State College/CO	8	III, Public	Univ Puerto Rico-Mayaguez	18/1046	III, Public
Univ of California-San Diego	8	I, Public	California Baptist College	2/122	IV, Private
University of Texas-El Paso	8	III, Public	New Mexico Inst Mining & Tech	2/133	V, Public
University of Florida	7	I, Public	Edgewood College/WI	1/69	IV, Private
University of New Mexico	7	II, Public	Univ Puerto Rico-Rio Piedras	58/4108	III, Public
Univ of California-Los Angeles	6	I, Public	Western New Mexico University	2/165	III, Public
Florida International Univ	6	III, Public	Dominican Coll San Rafael/CA	1/83	III, Public

* Named institutions refer to main campuses, unless otherwise noted.

** Type Legend:
I=Type I
II=Type II
III=Type III
IV=Type IV
V=Type V

when the measure is of output. Traditionally Black institutions eclipse all others in the ranked lists of baccalaureate sources of Black Ph.D.s. Hispanics seem anchored in certain regional areas. More research is needed to refine the "productivity" ratio by using racial/ethnic-specific data in the denominators.

Baccalaureate Sources: A Summary

The wide diversity of U.S. baccalaureate sources of doctorate recipients is striking: the 1984 Ph.D. cohort reported earning their B.A.s at 1,380 different American colleges and universities. A two-pronged approach was taken to the topic of baccalaureate sources: description of output and calculation of "productivity" ratios. Both institutional types and individual institutions were of interest.

Using the measure of "output," the B.A. origins of doctorate recipients since 1920 were documented. Comprehensive, or master's-degree granting, institutions grew rapidly as B.A. sources, particularly in the years following World War II. Continuing with the output approach, doctoral fields were characterized by the types of institutions that were predominant B.A. sources. For example, over three-quarters of the doctorate recipients in engineering earned their B.A.s from doctorate-granting institutions, while Ph.D.s in chemistry, social sciences, and the humanities came from a wider range of institutions, including Comprehensive and Liberal Arts colleges. Output was also differentiated by gender, revealing that women and men differed in their distribution of B.A. sources. This distinction was especially true in the case of the Liberal Arts institution, which was proportionately a larger source of baccalaureate education for women doctorate recipients than it was for men in 1984. Moreover, the minority groups differed in their types of baccalaureate sources: for American Indian, Black, and Hispanic Ph.D.s, the Type III institution was dominant; but for Asian doctorate recipients, the most important type was the Research I universities.

The second prong to approaching baccalaureate origins--that of calculating Ph.D. "productivity"--illuminated the wide range of institutional "productivity" and pointed out those institutions from which very high proportions of B.A. graduates go on to earn the doctorate. Overwhelmingly, these institutions were private. While as a group the Research I institutions proportionately had the highest "productivity" rates, Liberal Arts colleges were also quite visible as leading baccalaureate sources of doctorate recipients. As with the output measure, when a gender perspective was applied, "productivity" looked different for men and women: only 11 of 30 "top producers" on the combined list (37 percent) were found to be on the separate lists for both of the sexes, and both the men's and the women's lists for 1984 were dominated by private institutions. When lists were drawn up for three of the minority racial/ethnic groups, "productivity" rates changed again, although the preeminence of the private institutions continued. One of the most striking results was that for Black Ph.D.s, all 10 leading B.A. sources--by either measure--were traditionally Black institutions.

APPENDIX A: The Five Basic Tables

Explanation

Table titles and headings are generally self-explanatory, but a few terms need special definition or explanation. The survey questionnaire is reproduced on pages 47-49.

Table 1 Number of Doctorate Recipients by Sex and Subfield, 1984

Table 1A Number of Doctorate Recipients by Citizenship, Racial/Ethnic Group, and Subfield, 1984

Table 2 Statistical Profile of Doctorate Recipients by Field of Doctorate, 1984

Table 3 Sources of Support in Graduate School of Doctorate Recipients by Sex and Summary Field, 1984

Table 4 State of Doctoral Institution of Doctorate Recipients by Sex and Summary Field, 1984

Table 5 Statistical Profile of Doctorate Recipients by Racial/Ethnic Group and U.S. Citizenship Status, 1984

Tables 1 and 1A

Tables 1 and 1A display 1984 data by subfield of doctorate, corresponding to the fields specified in the Specialties List on page 49. The "general" field categories--e.g., "chemistry, general"--contain individuals who either received the doctorate in the general subject area or did not indicate a particular specialty field. The "other" field categories--e.g., "chemistry, other"--include individuals whose specified doctoral discipline was not included among the specialty fields.

Table 2

There are three two-page tables: one contains data about all doctorate recipients in 1984 and the other two present data by sex. Refer to the inside of the back cover of this report for the codes included in each broad field and to the Specialties List on page 49 for the codes and names of each subfield. Definitions are as follows:

Median Age at Doctorate: One-half received the doctorate at or before this age.

Percentage with Master's: The percentage of doctorate recipients in a field who received a master's degree in any field before earning the doctorate.

Median Time Lapse: "Total Time" refers to total calendar time elapsed between the year of baccalaureate and the year of doctorate; "Registered Time" refers to the total time registered in a university between baccalaureate and doctorate.

Each year's doctorate recipients provide information on postgraduation employment or study plans in response to items 19 and 20 on the survey form. Since the questionnaire is filled out at about the time the doctorate is received, these planned activities can be subject to change. However, comparisons with data from the longitudinal Survey of Doctorate Recipients have shown these data to be a reasonable predictor of actual employment status in the year following the doctorate.[9] Postgraduation plans of the doctorate recipients are grouped as follows: "Postdoctoral Study Plans" (fellowship,

[9] See discussion on page 22 of the 1982 Summary Report and also A Century of Doctorates: Data Analyses of Growth and Change (Washington, D.C.: National Academy of Sciences, 1978, pp. 92-93).

research associateship, traineeship, other), "Planned Employment" (educational institution, industry, etc.), or "Postdoctoral Status Unknown." The sum of these lines totals 100 percent for each column, with allowance for rounding: for example, 46.9 percent of all chemists had postdoctoral study plans, 47.1 percent planned employment, and 5.9 percent did not report their postgraduation plans; these total 99.9 percent. The study and employment rows are further subdivided, showing that 19.4 percent of all the chemists planned to pursue postdoctoral fellowships; 25.9 percent research associateships; 0.6 percent traineeships; and 0.9 percent some other form of postdoctoral study. The employment row is similarly subdivided; the percentages, listed by type of employer (educational institution, industry, etc.), total 47.1 percent planning employment.

The four lines of data beginning with "Definite Postdoctoral Study" distinguish between individuals who have definite postgraduation plans (item 18: "Am returning to, or continuing in, predoctoral appointment" or "Have signed contract or made definite commitment") and those who are still seeking employment or postdoctoral study (item 18: "Am negotiating with one or more specific organizations," "Am seeking appointment but have no definite prospects," or "Other"). These four lines, when added to the prior line, "Postdoctoral Status Unknown," total 100 percent with allowance for rounding. The two lines "Definite Postdoctoral Study" and "Seeking Postdoctoral Study" add to give the percentage having "Postdoctoral Study Plans," and the two lines, "Definite Employment" and "Seeking Employment," add to give the percentage having "Planned Employment After Doctorate."

Percentages showing the distribution of doctorate recipients by work activity and by region of employment are based on those who have a definite employment commitment. They exclude those still seeking employment and those planning postdoctoral study as described above.

Table 3

Displayed in Table 3 are data reported from item 16 on all sources of financial support during the course of individuals' graduate education. The response choices for source of support were revised in 1984 to provide more detailed information on items such as student loans and fellowship support. The data in the table should be interpreted as follows: 163 male doctorate recipients in the physical sciences reported financial support from National Science Foundation fellowships during graduate school. This number is 4.5 percent of the male physical sciences doctorates who answered the question, and it is 38.6 percent of the males in all fields who reported NSF fellowship support. Since students indicate multiple sources of support, the vertical percentages sum to more than 100 percent.

Table 4

Table 4 shows the number of persons receiving a doctorate from universities in each of the 50 states, the District of Columbia, and Puerto Rico.

Table 5

Table 5 contains data by racial/ethnic group (first included in the 1973 Summary Report) and by U.S. citizenship status for selected variables from Tables 2 and 3.

In 1977 the item on racial/ethnic group in the survey questionnaire was revised to coincide with the question format recommended by the Federal Interagency Committee on Education and adopted by the Office of Management and Budget (OMB) for use in federally sponsored surveys; an explanation of the effects of these changes is detailed on page 13 of the 1977 Summary Report. Changes in the OMB guidelines prompted the moving of persons having origins in the Indian subcontinent from the white category to Asian in 1978. In 1980 two survey revisions were made: (1) the category Hispanic was subdivided into Puerto Rican, Mexican American, and Other Hispanic

to provide more detail for users of the racial/ethnic data and (2) respondents were asked to check only one ethnic category. Prior to 1980 doctorate recipients could check more than one category to indicate their racial/ethnic background. However, when the data were compiled, all persons who checked Asian, American Indian, or Hispanic and also checked "white" were included in the minority-group category; and those whose responses were "Black" as well as any other category were designated as "Black." Evidence of this change was most pronounced in the American Indian group, where the majority of the respondents formerly checked "white" in addition to American Indian.

Beginning with the 1982 survey, this item was revised to separate questions on racial and ethnic groups. Respondents are first asked to check one of the four racial group categories (American Indian, Asian, Black, or white) and then to indicate Hispanic heritage. For purposes of analysis all respondents who indicated Hispanic heritage, regardless of racial identification, are included in one of the three Hispanic groups. The remaining survey respondents are then counted in the respective racial groups.

TABLE 1 Number of Doctorate Recipients by Sex and Subfield, 1984

Subfield of Doctorate	Number of Doctorates		
	Men	Women	Total
TOTAL ALL FIELDS	20593	10660	31253
PHYSICAL SCIENCES	3797	656	4453
MATHEMATICS	584	115	699
Applied Mathematics	92	16	108
Algebra	52	13	65
Analysis and Functional Analysis	58	12	70
Geometry	21	6	27
Logic	24	1	25
Number Theory	23	4	27
Probability and Math Statistics	151	31	182
Topology	32	10	42
Computing Theory and Practice	12	1	13
Operations Research	26	1	27
Mathematics, General	67	12	79
Mathematics, Other	26	8	34
COMPUTER SCIENCE	259	36	295
Computer Sciences	233	23	256
Information Sciences and Systems	26	13	39
PHYSICS AND ASTRONOMY	1001	79	1080
Astronomy	38	4	42
Astrophysics	48	8	56
Acoustics	21		21
Atomic and Molecular	74	3	77
Electron	2		2
Elementary Particles	130	8	138
Fluids	10	1	11
Nuclear	64	8	72
Optics	50	3	53
Plasma	70	3	73
Polymer	8		8
Solid State	240	18	258
Physics, General	158	12	170
Physics, Other	88	11	99
CHEMISTRY	1445	320	1765
Analytical	196	32	228
Inorganic	183	50	233
Nuclear	15	3	18
Organic	452	72	524
Pharmaceutical	41	15	56
Physical	266	63	329
Polymer	51	12	63
Theoretical	32	5	37
Chemistry, General	143	41	184
Chemistry, Other	66	27	93
EARTH, ATMOSPHERIC AND MARINE SCI	508	106	614
Atmospheric Physics and Chemistry	11		11
Atmospheric Dynamics	23	2	25
Meteorology	26	2	28
Atmos and Meteorological Sci, Gen	4	1	5
Atmos and Meteorological Sci, Other	9	3	12
Geology	102	22	124
Geochemistry	36	7	43
Geophysics and Seismology	61	7	68
Paleontology	29	6	35
Mineralogy, Petrology	22	6	28
Stratigraphy, Sedimentation	14	2	16
Geomorphology and Glacial Geology	8	1	9
Applied Geology	5	2	7
Geological Sciences, General	7	3	10
Geological Sciences, Other	21	4	25
Environmental Sciences	36	9	45
Hydrology and Water Resources	16	2	18
Oceanography	57	21	78
Marine Sciences	15	6	21
Physical Sciences, Other	6		6
ENGINEERING	2763	152	2915
Aerospace, Aeronaut & Astronaut	117	2	119
Agricultural	73	1	74
Bioengineering and Biomedical	61	10	71
Ceramic	23	2	25
Chemical	336	25	361
Civil	332	19	351
Communications	11		11
Computer	55	1	56
Electrical, Electronics	579	14	593
Engineering Mechanics	82	9	91
Engineering Physics	8		8
Engineering Science	28		28
Environmental Health Engineering	51	6	57
Industrial	69	16	85
Materials Science	151	17	168
Mechanical	330	6	336
Metallurgical	71	7	78
Mining and Mineral	16		16
Naval Architecture, Marine Eng	5		5
Nuclear	114	6	120
Ocean	11		11
Operations Research	50		50
Petroleum	17		17
Polymer	29	2	31
Systems	51	1	52
Engineering, General	29		29
Engineering, Other	64	8	72
LIFE SCIENCES	3957	1788	5745
BIOLOGICAL SCIENCES	2659	1213	3872
Biochemistry	415	191	606
Biophysics	69	21	90
Bacteriology	8	4	12
Plant Genetics	16	4	20
Plant Pathology	25	5	30
Plant Physiology	47	23	70
Botany, Other	88	38	126
Anatomy	65	37	102
Biometrics and Biostatistics	31	18	49
Cell Biology	74	48	122
Ecology	157	45	202
Embryology	7	8	15
Endocrinology	19	11	30
Entomology	127	29	156
Immunology	81	52	133
Molecular Biology	172	103	275
Microbiology	224	120	344
Neurosciences	101	43	144
Nutritional Sciences	41	68	109
Parasitology	26	4	30
Toxicology	72	25	97
Human and Animal Genetics	43	39	82
Human and Animal Pathology	65	22	87
Human and Animal Pharmacology	177	60	237
Human and Animal Physiology	178	59	237
Zoology, Other	116	42	158
Biological Sciences, General	136	56	192
Biological Sciences, Other	79	38	117
HEALTH SCIENCES	305	413	718
Audiology and Speech Pathology	36	68	104
Environmental Health	27	13	40
Public Health	17	35	52
Epidemiology	36	67	103
Nursing	7	153	160
Pharmacy	74	28	102
Veterinary Medicine	39	7	46
Health Sciences, General	8	5	13
Health Sciences, Other	61	37	98
AGRICULTURAL SCIENCES	993	162	1155
Agricultural Economics	129	29	158
Animal Breeding and Genetics	23	5	28
Animal Nutrition	64	7	71
Animal Sciences, Other	75	15	90
Agronomy	125	12	137
Plant Breeding and Genetics	70	8	78
Plant Pathology	49	8	57
Plant Sciences, Other	18	2	20
Food Sciences	81	32	113
Soil Sciences	95	4	99
Horticulture Science	45	21	66
Fisheries Science	40	5	45
Wildlife Management	28	3	31
Forestry Science	89	5	94
Agriculture, General	1		1
Agriculture, Other	61	6	67

TABLE 1 (Continued)

Subfield of Doctorate	Number of Doctorates		
	Men	Women	Total
SOCIAL SCIENCES (INCL PSYCH)	3488	2407	5895
Anthropology	164	171	335
Area Studies	21	2	23
Criminology	31	10	41
Demography	11	8	19
Economics	648	120	768
Econometrics	23	4	27
Geography	93	21	114
International Relations	82	13	95
Political Science and Government	322	97	419
Public Policy Studies	34	20	54
Sociology	289	226	515
Statistics	28	11	39
Urban Studies	60	21	81
Social Sciences, General	11	6	17
Social Sciences, Other	62	63	125
PSYCHOLOGY	1609	1614	3223
Clinical	583	581	1164
Cognitive	40	37	77
Comparative	4	9	13
Counseling	233	229	462
Developmental	52	155	207
Experimental	99	70	169
Educational	100	110	210
Industrial and Organizational	66	40	106
Personality	13	12	25
Physiological	53	20	73
Psychometrics	3	3	6
Quantitative	12	5	17
School	39	50	89
Social	75	82	157
Psychology, General	131	137	268
Psychology, Other	106	74	180
HUMANITIES	1942	1586	3528
History, American	156	83	239
History, European	102	48	150
History of Science	13	11	24
History, General	55	22	77
History, Other	84	42	126
Classics	35	22	57
Comparative Literature	50	83	133
Linguistics	78	82	160
Speech and Debate	27	14	41
Letters, General	8	6	14
Letters, Other	12	19	31
American Studies	43	33	76
Archeology	11	20	31
Art History and Criticism	37	104	141
Music	305	137	442
Philosophy	167	47	214
Religion	130	48	178
Theatre	54	47	101
LANGUAGE AND LITERATURE	543	683	1226
American	96	93	189
English	229	316	545
French	33	75	108
German	39	41	80
Italian	4	12	16
Spanish	65	79	144
Russian	19	14	33
Slavic	3	9	12
Chinese	5	8	13
Japanese	2	10	12
Hebrew	10	3	13
Arabic	6	2	8
Other Languages	32	21	53
Humanities, General	11	11	22
Humanities, Other	21	24	45

Subfield of Doctorate	Number of Doctorates		
	Men	Women	Total
PROFESSIONAL FIELDS	1313	604	1917
BUSINESS ADMINISTRATION	689	180	869
Accounting	122	41	163
Banking and Finance	109	14	123
Business Admin and Management	146	30	176
Business Economics	24	6	30
Marketing Management and Research	92	33	125
Business Statistics	6	1	7
Operations Research	38	7	45
Organizational Behavior	46	24	70
Business and Management, General	44	7	51
Business and Management, Other	62	17	79
COMMUNICATIONS	150	105	255
Communications Research	37	28	65
Journalism	15	2	17
Radio and Television	17	3	20
Communications, General	37	31	68
Communications, Other	44	41	85
OTHER PROFESSIONAL FIELDS	474	319	793
Architecture, Environmental Design	22	3	25
Home Economics	21	86	107
Law	22	2	24
Library and Archival Science	34	34	68
Public Administration	92	34	126
Social Work	101	130	231
Theology	177	27	204
Professional Fields, General	2		2
Professional Fields, Other	3	3	6
EDUCATION	3323	3457	6780
Curriculum and Instruction	321	543	864
Educational Admin and Supervision	936	618	1554
Educational Media	52	30	82
Educational Statistics and Research	57	48	105
Educational Testing, Eval and Meas	31	25	56
Educational Psychology	103	126	229
School Psychology	52	58	110
Social Foundations	98	53	151
Special Education	93	220	313
Student Counseling, Personnel Serv	202	188	390
Higher Education	321	333	654
Pre-elementary Education	10	44	54
Elementary Education	34	63	97
Secondary Education	26	36	62
Adult and Continuing Education	99	119	218
TEACHING FIELDS	568	602	1170
Agricultural Education	40	7	47
Art Education	20	21	41
Business Education	16	36	52
English Education	22	50	72
Foreign Languages Education	11	14	25
Health Education	26	68	94
Home Economics Education	1	25	26
Industrial Arts Education	22	5	27
Mathematics Education	34	30	64
Music Education	56	36	92
Nursing Education	2	19	21
Physical Education	131	88	219
Reading Education	27	115	142
Science Education	51	26	77
Social Science Education	11	10	21
Speech Education	3	7	10
Trade and Industrial Education	84	33	117
Other Teaching Fields	11	12	23
Education, General	150	161	311
Education, Other	170	190	360
OTHER AND UNSPECIFIED	10	10	20

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

TABLE 1A Number of Doctorate Recipients by Citizenship, Racial/Ethnic Group, and Subfield, 1984

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas Racial/Ethnic Group[1]							
			Total	Amer. Ind.	Asian	Black	White	Puerto Rican	Mexican/ Amer.	Other His-panic	Other & Unk
TOTAL ALL FIELDS	31253[2]	4817	25167	73	1017	1049	21792	133	178	294	631
PHYSICAL SCIENCES	4453	991	3325	7	213	44	2890	12	11	40	108
MATHEMATICS	699	232	443	3	30	4	380	2	4	5	15
Applied Mathematics	108	26	78		5	1	70				2
Algebra	65	21	43		4		38				1
Analysis and Functional Analysis	70	30	40		1	1	35		1	1	1
Geometry	27	10	17	1			16				
Logic	25	9	16		1		15				
Number Theory	27	7	20				19				1
Probability and Math Statistics	102	64	116	1	13	1	93	1	3	1	3
Topology	42	11	31		1		26	1		1	2
Computing Theory and Practice	13	5	8		1		5				2
Operations Research	27	12	15			1	13				1
Mathematics, General	79	26	36	1	2		30			2	1
Mathematics, Other	34	11	23		2		20				1
COMPUTER SCIENCE	295	89	194		20	3	162		1	2	6
Computer Sciences	256	78	167		16	3	141		1	2	4
Information Sciences and Systems	39	11	27		4		21				2
PHYSICS AND ASTRONOMY	1080	266	775	1	47	11	677		3	11	25
Astronomy	42	7	33				32			1	
Astrophysics	56	8	48				46				2
Acoustics	21	6	15		1	2	12				
Atomic and Molecular	77	16	61		4		53		1	1	2
Electron	2	2									
Elementary Particles	138	43	95	1	6		84		1	2	1
Fluids	11	2	9		1		7				1
Nuclear	72	14	58		3	1	50			2	2
Optics	53	12	40		2	1	36				1
Plasma	73	13	59		4	1	52		1		1
Polymer	8	4	4				4				
Solid State	258	68	190		16	4	162			4	4
Physics, General	170	51	87		6	1	71				9
Physics, Other	99	20	76		4	1	68			1	2
CHEMISTRY	1765	298	1414	3	97	23	1210	10	3	20	48
Analytical	228	37	190	1	6	1	175	1		2	4
Inorganic	233	28	205		5	1	190		1	1	7
Nuclear	18	6	12		2		8			1	1
Organic	524	82	440	1	32	11	376	4		8	8
Pharmaceutical	56	7	48		8		36	1			3
Physical	329	46	281		15	6	242	2		6	10
Polymer	63	15	48		12		35				1
Theoretical	37	7	30				28				2
Chemistry, General	184	48	93		10	2	65	1	2	2	11
Chemistry, Other	93	22	67	1	7	2	55	1			1
EARTH, ATMOSPHERIC AND MARINE SCI	614	106	499		19	3	461			2	14
Atmospheric Physics and Chemistry	11	2	9				8				1
Atmospheric Dynamics	25	8	17		3		14				
Meteorology	28	5	23		2		20				1
Atmos and Meteorological Sci, Gen	5	1	4				4				
Atmos and Meteorological Sci, Other	12	3	8				8				
Geology	124	22	100		1	1	95				3
Geochemistry	43	5	38		2		36				
Geophysics and Seismology	68	15	50		2		45				3
Paleontology	35	3	32		1		29				2
Mineralogy, Petrology	28	1	27				26				1
Stratigraphy, Sedimentation	16	2	14				14				
Geomorphology and Glacial Geology	9	1	8				8				
Applied Geology	7	1	6				6				
Geological Sciences, General	10	1	9		1		6			1	1
Geological Sciences, Other	25	7	18				18				
Environmental Sciences	45	5	39		2		36				1
Hydrology and Water Resources	18	4	14		1	1	12				
Oceanography	78	14	62		3	1	57			1	
Marine Sciences	21	4	17				16				1
Physical Sciences, Other	6	2	4		1		3				
ENGINEERING	2915	1268	1514	3	250	15	1157	7	6	21	55
Aerospace, Aeronaut & Astronaut	119	58	57		7		47			1	2
Agricultural	74	40	32		5		25				2
Bioengineering and Biomedical	71	15	53		3	1	45			2	2
Ceramic	25	8	17		1		15			1	
Chemical	361	146	199	2	34	2	150	1		2	8
Civil	351	167	164	1	31		127	1			4

1/For an explanation of racial/ethnic groups see items 8 and 9 on questionnaire on page 47 and description on page 26.
2/Includes 1,269 individuals who did not report their citizenship at time of doctorate.

TABLE 1A (Continued)

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas Racial/Ethnic Group[1]								
			Total	Amer. Ind.	Asian	Black	White	Puerto Rican	Mex-ican/ Amer.	Other His-panic	Other & Unk
Communications	11	2	9		1		7				1
Computer	56	21	33		6	1	26				
Electrical, Electronics	593	248	313		59	3	230	4	2	2	13
Engineering Mechanics	91	40	49		7		41				1
Engineering Physics	8	1	7				7				
Engineering Science	28	16	12		1		9			1	1
Environmental Health Engineering	57	20	37		2		33		1	1	
Industrial	85	42	37		6	1	28	1		1	
Materials Science	168	74	93		21		62			2	8
Mechanical	336	164	153		30	2	113		2	3	3
Metallurgical	78	36	40		10		27			2	1
Mining and Mineral	16	7	9		4		4				1
Naval Architecture, Marine Eng	5	2	3				3				
Nuclear	120	45	69		6	1	58			1	3
Ocean	11	7	4				4				
Operations Research	50	16	33		2		31				
Petroleum	17	9	6				6				
Polymer	31	18	12		4		7				1
Systems	52	23	29		7	2	17		1	2	
Engineering, General	29	17	7				5				2
Engineering, Other	72	26	37		3	2	30				2
LIFE SCIENCES	5745	818	4752	12	220	97	4234	12	12	41	124
BIOLOGICAL SCIENCES	3872	360	3395	10	158	50	3040	8	7	29	93
Biochemistry	606	62	525	1	33	5	471			4	11
Biophysics	90	9	76		6		65				5
Bacteriology	12		11		1	1	9				
Plant Genetics	20	2	18				17				1
Plant Pathology	30	8	21				21				
Plant Physiology	70	10	60		3	1	53				3
Botany, Other	126	9	113	1	1	1	103	1	1		5
Anatomy	102	8	92		2	3	83			3	1
Biometrics and Biostatistics	49	10	39	1	6	1	30				1
Cell Biology	122	6	113		4	6	99	1		1	2
Ecology	202	12	190		1	2	182	1			4
Embryology	15	2	13	1		1	10		1		
Endocrinology	30	2	28		4	2	21			1	
Entomology	156	39	113		3		103		1	1	5
Immunology	133	10	121	3	6	1	108			1	2
Molecular Biology	275	16	256	1	13	2	237	1			2
Microbiology	344	31	303		16	5	271	1		3	7
Neurosciences	144	10	131		7	1	119			1	3
Nutritional Sciences	109	15	88		7	3	74				4
Parasitology	30	3	27			2	23			1	1
Toxicology	97	2	94		4	1	86				3
Human and Animal Genetics	82	3	74		5	1	67				1
Human and Animal Pathology	87	8	75		4	3	66		1		1
Human and Animal Pharmacology	237	24	209		12	3	184	2	1	2	5
Human and Animal Physiology	237	20	214	1	8	3	193			3	6
Zoology, Other	158	10	147		3	1	137		1	1	4
Biological Sciences, General	192	20	143	1	6	1	122		1	5	7
Biological Sciences, Other	117	9	101		3		86	1		2	9
HEALTH SCIENCES	718	75	615	1	37	26	524	3	4	4	16
Audiology and Speech Pathology	104	4	98		2	3	90	1			2
Environmental Health	40	5	35		4	2	28				1
Public Health	52	2	46		5	2	31		2	2	4
Epidemiology	103	14	87		2	6	75		1		3
Nursing	160	4	155		1	7	142		1	1	3
Pharmacy	102	18	74		16	2	55	1			
Veterinary Medicine	46	15	30		1	1	25			1	2
Health Sciences, General	13	1	9				9				
Health Sciences, Other	98	12	81	1	6	3	69	1			1
AGRICULTURAL SCIENCES	1155	383	742	1	25	21	670	1	1	8	15
Agricultural Economics	158	71	82		5	3	68			2	4
Animal Breeding and Genetics	28	9	19			1	17				1
Animal Nutrition	71	20	50		1	2	46			1	
Animal Sciences, Other	90	27	57		1	1	52	1	1		1
Agronomy	137	59	75		3	3	68				1
Plant Breeding and Genetics	78	19	57		2		53			1	1
Plant Pathology	57	21	34			3	28			2	1
Plant Sciences, Other	20	4	16		1	2	12			1	
Food Sciences	113	47	62		6	4	51				1
Soil Sciences	99	44	55		2		50			1	2
Horticulture Science	66	15	49			1	48				
Fisheries Science	45	9	36	1	1		34				
Wildlife Management	31	3	28		1		26				1
Forestry Science	94	12	81				79				2
Agriculture, General	1		1				1				
Agriculture, Other	67	23	40		2	1	37				

TABLE 1A (Continued)

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas Racial/Ethnic Group[1]								
			Total	Amer. Ind.	Asian	Black	White	Puerto Rican	Mex-ican/ Amer.	Other His-panic	Other & Unk
SOCIAL SCIENCES (INCL PSYCH)	5895	634	4944	10	120	222	4350	32	40	64	106
Anthropology	335	28	289	2	5	10	257		1	4	10
Area Studies	23	6	16			1	11			1	2
Criminology	41	9	32			2	28				2
Demography	19	10	8				8				
Economics	768	239	496	1	32	20	420	2	2	8	11
Econometrics	27	10	17				14		1	1	1
Geography	114	28	83		3	3	75	2			
International Relations	95	26	58		6	1	47				4
Political Science and Government	419	65	328		13	20	266	2	4	4	19
Public Policy Studies	54	6	48		1	4	41		1		1
Sociology	515	62	434	1	11	28	373	4	6	7	4
Statistics	39	21	15		1		13				1
Urban Studies	81	17	55		3	4	47				1
Social Sciences, General	17	6	8		1		7				
Social Sciences, Other	125	14	102		1	8	87	2		1	3
PSYCHOLOGY	3223	87	2956	6	43	121	2656	20	25	38	47
Clinical	1164	6	1107	2	17	47	992	11	14	11	13
Cognitive	77	10	67			1	64		1	1	
Comparative	13		13				13				
Counseling	462	6	450	2	2	26	404	1	4	7	4
Developmental	207	11	194		3	4	177	1	1	5	3
Experimental	169	5	164	1	3	3	153	1	1	1	1
Educational	210	10	188		5	6	172	1		1	3
Industrial and Organizational	106	4	101			5	95			1	
Personality	25	1	23			1	22				
Physiological	73	3	70		1	1	62	1		3	2
Psychometrics	6		6				6				
Quantitative	17		17		1		16				
School	89	2	83			6	74	2			1
Social	157	7	147		5	9	128		1		4
Psychology, General	268	8	178	1	4	8	145	2	3	4	11
Psychology, Other	180	14	148		2	4	133			4	5
HUMANITIES	3528	251	3095	5	56	101	2735	22	25	66	85
History, American	239	6	231	1	4	11	206		2		7
History, European	150	5	145	1		3	133			3	5
History of Science	24	1	21				20				1
History, General	77	3	54			5	43		1		5
History, Other	126	13	109		5	9	89	1		3	2
Classics	57	2	53	1		1	50				1
Comparative Literature	133	19	104		1	3	95	2	2	1	
Linguistics	160	50	106		8	3	83	1	2	4	5
Speech and Debate	41	1	39			1	38				
Letters, General	14		13				13				
Letters, Other	31	2	28				24	1		1	2
American Studies	76	3	72			11	59				2
Archeology	31	1	30				29				1
Art History and Criticism	141	2	134		4	1	119			3	7
Music	442	16	389		2	10	363	3		1	10
Philosophy	214	15	184	1	6		166		2	1	8
Religion	178	12	164		4	10	148			1	1
Theatre	101	9	89		1	4	82			1	1
LANGUAGE AND LITERATURE	1226	84	1075	1	18	26	930	14	14	47	25
American	189	8	181		1	7	170	1	1	1	
English	545	28	486		7	13	444	1	1	7	13
French	108	10	94			1	86		2	3	2
German	80	3	69	1	1		64		1		2
Italian	16	2	13				12				1
Spanish	144	13	125			5	64	12	9	35	
Russian	33	2	30				29				1
Slavic	12	1	8				7				1
Chinese	13	2	11		4		7				
Japanese	12		12		5		5				2
Hebrew	13	1	11				11				
Arabic	8	6	2				2				
Other Languages	53	8	33				29			1	3
Humanities, General	22		21			2	18		1		
Humanities, Other	45	7	34		3	1	27		1		2

TABLE 1A (Continued)

Subfield of Doctorate	Total Doctorates	Non-U.S. Citizens Temp. Visas	U.S. Citizens and Non-U.S. with Permanent Visas Racial/Ethnic Group[1/]								
			Total	Amer. Ind.	Asian	Black	White	Puerto Rican	Mex-ican/ Amer.	Other His-panic	Other & Unk
PROFESSIONAL FIELDS	1917	317	1504	4	66	61	1290	11	12	14	46
BUSINESS ADMINISTRATION	869	186	641	2	44	13	550	2	3	6	21
Accounting	163	24	139		9	7	120				3
Banking and Finance	123	37	82		10		67			2	3
Business Admin and Management	176	34	126	1	10	2	105	1	2	1	4
Business Economics	30	8	22		2	1	18	1			
Marketing Management and Research	125	29	93	1	5	1	81			2	3
Business Statistics	7	3	4				4				
Operations Research	45	16	29		1		23		1	1	3
Organizational Behavior	70	11	58		3	1	54				
Business and Management, General	51	7	27				23				4
Business and Management, Other	79	17	61		4	1	55				1
COMMUNICATIONS	255	30	216		6	10	193	2	1	3	1
Communications Research	65	9	55		1	2	49	1	1	1	
Journalism	17	7	10				10				
Radio and Television	20	1	19			2	17				
Communications, General	68	6	58		4	2	50			2	
Communications, Other	85	7	74		1	4	67	1			1
OTHER PROFESSIONAL FIELDS	793	101	647	2	16	38	547	7	8	5	24
Architecture, Environmental Design	25	13	10		1		8			1	
Home Economics	107	10	93		1	2	86		2	1	1
Law	24	13	8		1		7				
Library and Archival Science	68	15	51	1	4	5	38		1		2
Public Administration	126	15	104	1	2	8	80	3	1		9
Social Work	231	13	196		2	21	157	3	3	2	8
Theology	204	20	179		5	2	165	1	1	1	4
Professional Fields, General	2	1	1				1				
Professional Fields, Other	6	1	5				5				
EDUCATION	6780	537	6015	32	92	509	5119	37	72	48	106
Curriculum and Instruction	864	82	769	2	8	76	634	9	19	11	10
Educational Admin and Supervision	1554	71	1448	9	18	124	1231	5	18	12	31
Educational Media	82	18	64		3	2	58	1			
Educational Statistics and Research	105	17	87	1	2	3	80				1
Educational Testing, Eval and Meas	56	13	43	1	1	4	36			1	
Educational Psychology	229	15	212	1	1	13	185		4		8
School Psychology	110	1	105		2	4	96			1	2
Social Foundations	151	22	125	2	1	11	101	1	3	3	3
Special Education	313	18	292	1	3	13	273				2
Student Counseling, Personnel Serv	390	14	369	1	6	41	312	1	3	2	3
Higher Education	654	48	595	3	10	57	504	3	5	3	10
Pre-elementary Education	54	4	38		1	5	31	1			
Elementary Education	97	4	88		1	7	78		2		
Secondary Education	62	5	53			7	43			2	1
Adult and Continuing Education	218	13	199	3	2	15	173	1	2	2	1
TEACHING FIELDS	1170	137	1001	4	18	83	866	6	5	2	17
Agricultural Education	47	21	26		1	3	21				1
Art Education	41	6	35		1	2	27	2	1		2
Business Education	52		52		1	7	44				
English Education	72	5	65		1	6	57				1
Foreign Languages Education	25	10	15		1		12	1		1	
Health Education	94	5	87	1	3	7	70		1		5
Home Economics Education	26	1	25			3	22				
Industrial Arts Education	27	4	21	1	3		17				
Mathematics Education	64	12	51	1		2	46	1			1
Music Education	92	4	85		1	9	75				
Nursing Education	21		18	1		2	15				
Physical Education	219	29	181		1	9	168	1			2
Reading Education	142	7	132			9	121		1		1
Science Education	77	18	56			4	51				1
Social Science Education	21	1	20		3	3	12	1			1
Speech Education	10		10				10				
Trade and Industrial Education	117	12	101		1	16	82				2
Other Teaching Fields	23	2	21		1	1	16		2	1	
Education, General	311	25	206	2	5	17	165	1	3	2	11
Education, Other	360	30	321	2	10	27	253	8	8	7	6
OTHER AND UNSPECIFIED	20	1	18				17				1

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

TABLE 2 Statistical Profile of Doctorate Recipients by Field of Doctorate, 1984[1/]

Total All Doctorates

		1984 Total	Physics and Astronomy	Chemistry	Earth, Atmospheric and Marine Sciences	Physical Sciences	Mathematics	Computer Sciences	Engineering	EHP Fields	Biochemistry	Other Biosciences	Biosciences	Health Sciences	Agricultural Sciences	Life Sciences
Number in Field		31253	1080	1765	614	3459	699	295	2915	7368	606	3266	3872	718	1155	5745
Male	%	65.9	92.7	81.9	82.7	85.4	83.5	87.8	94.8	89.0	68.5	68.7	68.7	42.5	86.0	68.9
Female		34.1	7.3	18.1	17.3	14.6	16.5	12.2	5.2	11.0	31.5	31.3	31.3	57.5	14.0	31.1
U.S. Citizenship	%	76.6	68.4	75.5	77.2	73.6	58.2	60.0	42.5	59.3	82.3	85.2	84.7	80.8	60.4	79.4
Non-U.S., Permanent Visa		3.9	3.3	4.6	4.1	4.1	5.2	5.8	9.4	6.4	4.3	2.7	2.9	4.9	3.8	3.4
Non-U.S., Temporary Visa		15.4	24.6	16.9	17.3	19.4	33.2	30.2	43.5	30.7	10.2	9.1	9.3	10.4	33.2	14.2
Unknown		4.1	3.6	3.0	1.5	2.9	3.4	4.1	4.6	3.7	3.1	3.0	3.0	3.9	2.6	3.0
Married	%	58.4	46.6	52.4	59.6	51.9	48.6	57.3	58.6	54.5	52.5	54.1	53.8	58.2	71.0	57.8
Not Married		36.0	48.4	43.3	37.9	43.9	46.8	37.6	34.8	40.3	43.2	41.3	41.6	36.5	24.9	37.6
Unknown		5.6	5.0	4.3	2.4	4.2	4.6	5.1	6.6	5.2	4.3	4.6	4.6	5.3	4.1	4.6
Median Age at Doctorate		33.0	29.5	28.7	31.6	29.5	30.2	31.2	30.7	30.1	29.2	30.6	30.4	34.0	31.8	31.0
Percent with Bacc in Same Field as Doctorate		56.5	80.2	84.4	53.9	77.7	77.3	15.6	74.3	73.8	25.2	66.0	59.6	49.2	58.4	58.1
Percent with Masters		80.4	65.5	38.4	73.9	53.2	72.5	89.5	88.8	70.5	30.4	55.1	51.2	83.7	91.8	63.4
Median Time Lapse From Bacc to Doct																
Total Time	Yrs	10.0	7.2	6.3	8.8	7.0	7.7	8.8	8.0	7.5	6.9	8.0	7.8	11.0	8.4	8.2
Registered Time		6.8	6.5	5.4	6.7	6.0	6.1	6.4	5.8	5.9	6.0	6.4	6.4	6.6	5.9	6.3
Postdoctoral Study Plans	%	20.5	50.1	46.9	34.4	45.7	16.2	8.1	16.4	29.8	78.7	64.5	66.7	16.2	21.4	51.3
Fellowship		9.7	15.1	19.4	11.7	16.7	6.9	1.7	4.2	10.2	46.7	37.7	39.1	10.0	5.9	28.8
Research Assoc		8.3	34.2	25.9	22.3	27.9	6.3	5.8	10.5	18.1	21.3	19.8	20.0	3.2	14.3	16.8
Traineeship		1.0	.4	.6	.0	.4	2.3	.3	1.4	1.0	2.3	1.6	1.7	1.0	.4	1.4
Other		1.5	.5	.9	.3	.7	.7	.3	.4	.5	8.4	5.3	5.8	1.9	.8	4.3
Planned Employment After Doctorate	%	72.5	43.4	47.1	62.2	48.7	77.4	87.5	74.1	63.0	15.5	29.7	27.5	77.0	72.5	42.7
Educ Institution		42.5	11.9	8.2	25.6	12.4	58.2	43.4	27.0	23.8	4.1	14.8	13.1	43.9	36.8	21.7
Industry/Business		13.9	20.6	34.0	20.4	27.4	12.0	36.6	35.7	29.6	8.1	7.0	7.2	13.8	16.0	9.8
Government		7.6	8.3	3.6	12.1	6.5	4.9	3.1	8.6	7.0	1.5	4.4	4.0	9.9	13.6	6.6
Nonprofit		4.7	.8	.5	1.0	.7	1.0	2.4	.9	.9	1.2	1.7	1.6	5.8	1.6	2.1
Other & Unknown		3.7	1.9	1.1	3.3	1.7	1.3	2.0	2.0	1.8	.7	1.7	1.6	3.6	4.5	2.4
Postdoct Status Unknown	%	7.0	6.5	5.9	3.4	5.7	6.4	4.4	9.5	7.2	5.8	5.9	5.9	6.8	6.1	6.0
Definite Postdoctoral Study		14.4	38.3	35.2	22.6	33.9	10.9	5.8	9.3	20.9	62.2	50.4	52.2	11.6	12.2	39.1
Seeking Postdoctoral Study		6.1	11.8	11.7	11.7	11.7	5.3	2.4	7.1	8.9	16.5	14.1	14.4	4.6	9.2	12.7
Definite Employment		51.7	29.9	36.3	47.6	36.3	58.6	69.5	53.2	46.4	11.1	19.6	18.3	57.2	47.7	29.1
Seeking Employment		20.8	13.5	10.8	14.7	12.3	19.0	18.0	20.9	16.6	4.5	10.1	9.2	19.8	24.8	13.6
Employment Activity After Doctorate Primary Activity																
R & D	%	26.5	68.7	77.8	56.5	70.5	41.9	59.5	62.2	62.7	71.6	48.4	50.6	33.1	60.3	49.5
Teaching		37.5	20.4	12.2	24.0	17.0	51.5	29.3	23.8	24.9	13.4	30.0	28.4	37.7	21.4	28.4
Administration		14.7	.9	.6	3.1	1.3	.7	3.4	2.3	1.8	1.5	3.6	3.4	11.2	3.3	5.3
Prof. Services		13.0	2.5	2.7	8.9	4.1	2.5	1.0	4.9	4.1	6.0	10.2	9.8	13.4	6.7	9.6
Other		2.6	1.5	1.7	3.8	2.1	.5	1.5	2.4	2.0	4.5	3.1	3.3	.5	2.2	2.2
Activity Unknown		5.6	5.9	5.0	3.8	4.9	2.9	5.4	4.4	4.5	3.0	4.7	4.5	4.1	6.2	5.0
Secondary Activity																
R & D		24.9	15.8	8.9	24.0	14.2	40.4	25.9	22.4	21.7	9.0	28.0	26.2	32.8	19.2	25.5
Teaching		13.2	7.4	4.5	15.8	7.9	24.0	18.0	13.1	12.8	6.0	15.6	14.7	14.3	18.3	15.8
Administration		9.5	9.3	15.4	8.2	12.2	3.7	4.4	7.0	8.3	19.4	12.2	12.9	12.7	12.5	12.7
Prof. Services		6.9	5.0	4.8	5.8	5.1	4.2	2.9	4.3	4.5	7.5	5.3	5.5	8.3	4.7	5.9
Other		2.1	.9	.2	2.1	.8	1.2	1.0	1.0	.9	.8	2.3	2.1	1.7	1.8	1.9
No Secondary Activity		37.7	55.7	61.2	40.4	54.9	23.5	42.4	47.8	47.2	55.2	31.9	34.1	26.3	37.2	33.2
Unknown		5.6	5.9	5.0	3.8	4.9	2.9	5.4	4.4	4.5	3.0	4.7	4.5	4.1	6.2	5.0
Region of Employment After Doctorate																
New England	%	6.3	9.3	3.9	2.7	5.0	8.6	10.7	6.3	6.4	11.9	5.0	5.7	4.6	1.6	4.1
Middle Atlantic		14.9	13.3	26.2	9.2	18.9	19.9	22.9	14.1	17.1	13.4	15.2	15.0	14.8	4.9	11.6
East No Central		12.5	9.0	20.4	7.9	14.6	18.3	8.8	11.6	12.4	16.4	11.6	12.0	11.2	8.5	10.7
West No Central		6.2	1.9	7.3	3.1	4.9	6.1	3.9	3.5	4.4	4.5	5.9	5.8	5.8	10.7	7.4
South Atlantic		14.9	13.3	14.4	12.0	13.5	15.9	10.2	13.0	13.4	14.9	16.3	16.1	18.5	10.9	15.0
East So Central		4.0	3.1	2.2	2.4	2.5	3.2	1.5	2.6	2.6	6.0	3.0	3.3	4.9	2.9	3.5
West So Central		7.7	4.6	5.1	20.9	8.7	9.1	2.9	6.2	7.3	3.0	5.5	5.2	10.0	8.3	7.4
Mountain		4.8	8.7	2.3	10.3	5.8	3.7	5.9	5.9	5.6	1.5	5.9	5.5	4.4	5.6	5.3
Pacific & Insular		11.1	21.4	8.7	17.1	13.9	10.5	21.0	15.4	14.6	10.4	11.3	11.2	10.5	8.0	9.9
Foreign		9.8	10.8	4.4	11.3	7.6	9.1	7.3	16.2	11.7	10.4	15.5	15.0	8.8	34.1	19.8
Region Unknown		7.8	4.6	5.0	3.1	4.5	3.7	4.9	5.1	4.7	7.5	5.0	5.2	6.6	4.4	5.3

1/Refer to explanatory note on page 25 and the description of doctoral fields inside back cover.

TABLE 2 (Continued)

Total All Doctorates

Psychology	Economics	Anthropology and Sociology	Political Sci. and International Rel.	Other Social Sciences	Social Sciences Incl. Psychology	Total Sciences	History	Eng. and Amer. Lang. and Lit.	Foreign Lang. and Lit.	Other Humanities	Humanities	Business and Management	Other Professional Fields	Education	Total Non-Sciences	Other or Unspecified 2/
3223	795	850	514	513	5895	19008	616	734	492	1686	3528	869	1048	6780	12225	20
49.9	84.4	53.3	78.6	68.4	59.2	73.7	66.6	44.3	44.3	58.7	55.0	79.3	59.5	49.0	53.8	50.0
50.1	15.6	46.7	21.4	31.6	40.8	26.3	33.4	55.7	55.7	41.3	45.0	20.7	40.5	51.0	46.2	50.0
90.1	56.0	82.5	68.7	67.6	80.6	72.0	88.0	88.3	72.0	83.5	83.7	66.5	80.0	86.8	83.9	
1.6	8.6	2.6	6.4	3.7	3.3	4.5	2.9	2.6	11.0	3.1	4.1	7.2	2.4	1.9	2.9	
2.7	31.3	10.6	17.7	22.8	10.8	19.5	4.5	4.9	9.8	8.2	7.1	21.4	12.5	7.9	9.0	
5.6	4.2	4.4	7.2	5.8	5.4	4.0	4.5	4.2	7.3	5.2	5.2	4.8	5.2	3.4	4.1	
53.2	58.7	54.7	55.1	60.4	54.9	55.6	60.9	54.5	54.3	53.5	55.1	63.3	62.2	66.8	62.8	
40.2	35.3	39.4	34.8	31.4	38.2	38.8	32.5	39.4	36.6	39.7	38.0	28.9	29.8	28.8	31.5	
6.6	5.9	5.9	10.1	8.2	6.9	5.5	6.7	6.1	9.1	6.8	6.9	7.8	8.0	4.4	5.7	
32.3	31.4	34.2	33.2	34.8	32.7	31.1	35.1	34.3	34.7	34.3	34.5	34.4	36.7	38.4	36.8	
65.5	62.0	56.9	57.4	21.6	59.3	64.6	65.1	72.5	55.9	54.4	60.2	38.4	21.9	39.6	44.0	
80.1	75.8	87.6	88.3	91.6	82.4	72.1	90.6	87.7	88.4	87.5	88.2	88.5	94.8	96.4	93.4	
9.3	8.6	11.0	10.0	11.6	9.7	8.3	12.0	11.5	11.3	11.3	11.5	11.1	13.3	14.6	13.4	
6.9	6.3	8.3	7.3	7.4	7.1	6.3	8.9	8.1	8.4	7.9	8.2	6.8	7.4	7.6	7.7	
17.3	6.0	14.0	5.6	9.4	13.6	31.3	7.3	3.1	5.5	6.3	5.7	1.8	2.7	3.2	3.8	
9.7	2.5	8.7	2.7	5.1	7.6	15.0	4.2	1.8	3.0	2.8	2.9	.2	.9	1.0	1.4	
3.1	2.5	3.8	1.0	3.5	3.0	13.0	1.0	.1	1.4	1.4	1.0	.8	.6	1.0	1.0	
3.2	.6	.4	.2	.6	2.0	1.4	.2	.3	.2	.3	.3	.6	.7	.4	.4	
1.3	.4	1.2	1.8	.2	1.1	1.9	1.9	1.0	.8	1.9	1.6	.2	.6	.8	1.0	
75.4	87.0	78.1	82.3	80.9	78.4	61.7	83.1	89.5	83.1	84.1	84.9	90.6	89.1	91.4	89.3	
26.8	56.2	49.3	57.4	44.8	38.2	27.6	58.4	75.6	68.5	65.1	66.6	74.2	53.7	65.8	65.6	
16.8	9.3	7.4	6.2	11.1	13.0	18.5	5.7	6.0	5.1	6.3	6.0	10.7	8.8	6.7	6.9	
10.5	14.0	6.9	9.5	11.9	10.5	8.0	8.0	1.5	2.6	2.2	3.1	2.8	7.5	9.4	7.0	
15.5	2.1	8.7	3.1	4.7	10.7	4.3	4.7	1.4	2.0	6.2	4.4	.9	13.9	5.1	5.3	
5.8	5.4	5.8	6.0	8.4	6.0	3.3	6.3	5.0	4.9	4.3	4.9	2.0	5.2	4.4	4.4	
7.3	6.9	7.9	12.1	9.7	8.0	7.1	9.6	7.4	11.4	9.5	9.4	7.6	8.2	5.4	6.9	
11.2	3.4	8.0	2.5	3.3	8.3	22.5	3.4	1.6	1.8	2.8	2.6	.8	1.5	1.6	1.8	
6.1	2.6	6.0	3.1	6.0	5.3	8.8	3.9	1.5	3.7	3.5	3.2	1.0	1.1	1.7	2.0	
50.5	69.1	49.2	54.3	56.5	53.7	43.4	48.5	55.3	53.5	54.4	53.5	77.9	68.7	67.8	64.5	
24.9	18.0	28.9	28.0	24.4	24.7	18.2	34.6	34.2	29.7	29.7	31.5	12.7	20.4	23.5	24.8	
16.1	38.8	30.4	17.6	26.9	23.0	44.8	12.7	1.7	5.7	7.3	6.7	22.5	7.5	5.3	7.3	
16.5	43.2	43.8	56.6	43.8	30.8	27.9	57.5	78.6	78.7	67.6	69.9	61.9	51.3	35.7	47.6	
5.4	3.1	10.0	9.7	12.8	6.7	4.4	11.7	8.1	4.2	7.5	7.8	6.6	15.6	37.2	25.6	
55.7	4.2	6.5	3.9	7.9	31.3	15.6	8.0	3.9	2.7	6.9	5.8	3.2	14.2	12.7	10.4	
1.5	4.0	2.6	3.2	4.1	2.5	2.2	4.3	3.9	3.0	4.1	4.0	1.9	4.4	2.5	3.0	
4.9	6.7	6.7	9.0	4.5	5.8	5.1	5.7	3.7	5.7	6.5	5.7	3.8	7.1	6.7	6.2	
21.3	39.3	37.1	41.9	34.8	29.6	25.5	27.8	33.5	43.7	31.4	33.0	48.9	31.9	16.0	24.3	
16.6	18.9	14.1	9.0	11.0	15.5	14.4	8.0	6.2	4.9	10.0	8.2	19.6	13.1	12.1	11.9	
11.2	4.2	10.0	7.9	8.3	9.3	9.6	12.4	7.9	6.1	8.3	8.5	4.3	12.2	10.0	9.4	
7.6	3.5	4.1	5.4	7.6	6.2	5.5	4.7	3.2	1.5	4.7	3.9	3.7	7.9	11.2	8.5	
2.8	.9	1.4	2.2	1.0	2.1	1.6	1.7	3.0	3.0	5.7	4.1	1.6	2.2	2.3	2.7	
35.7	26.4	26.6	24.7	32.8	31.6	38.4	39.8	42.6	35.0	33.4	36.6	18.0	25.6	41.7	37.0	
4.9	6.7	6.7	9.0	4.5	5.8	5.1	5.7	3.7	5.7	6.5	5.7	3.8	7.1	6.7	6.2	
7.3	7.8	7.9	5.0	5.9	7.1	6.2	9.4	7.6	13.7	7.0	8.4	6.2	4.6	5.9	6.4	
19.4	14.2	16.0	15.1	13.1	17.1	16.0	16.1	17.2	16.7	16.0	16.4	10.2	12.8	13.5	13.9	
12.9	12.4	12.9	10.0	10.3	12.3	12.0	12.7	15.5	12.2	12.9	13.3	14.0	15.6	12.3	13.0	
6.6	4.7	3.8	6.5	3.8	5.7	5.5	4.7	5.9	6.1	7.8	6.7	4.3	7.2	7.5	7.0	
13.6	21.7	13.9	18.3	16.9	15.7	14.6	14.0	15.3	14.1	13.9	14.3	15.5	11.5	16.1	15.2	
3.1	2.9	2.6	1.4	2.8	2.8	2.9	5.4	4.9	1.9	3.7	4.0	5.3	6.5	5.5	5.2	
7.4	5.3	6.2	6.1	4.1	6.4	7.0	8.7	7.6	5.3	7.2	7.3	12.9	9.7	8.1	8.4	
4.5	2.6	6.2	3.6	3.1	4.2	5.0	2.7	2.2	4.2	2.6	2.8	3.8	2.4	5.7	4.6	
13.6	6.4	10.8	11.8	12.4	11.7	12.6	13.0	7.9	9.1	12.1	10.9	11.2	9.9	8.9	9.7	
2.1	16.8	10.3	12.2	16.9	8.0	11.9	6.4	4.4	7.6	8.9	7.4	11.7	12.2	6.2	7.5	
9.5	5.3	9.3	10.0	10.7	8.9	6.4	7.0	11.3	9.1	7.8	8.6	4.9	7.6	10.3	9.2	

2/Statistics are not presented for this group because too few records contained the specified data.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

TABLE 2 Statistical Profile of Doctorate Recipients by Field of Doctorate, 1984[1/]

Doctorates: Men

		1984 Total	Physics and Astronomy	Chemistry	Earth, Atmospheric and Marine Sciences	Physical Sciences	Mathematics	Computer Sciences	Engineering	EHP Fields	Biochemistry	Other Biosciences	Biosciences	Health Sciences	Agricultural Sciences	Life Sciences
Total Male		20593	1001	1445	508	2954	584	259	2763	6560	415	2244	2659	305	993	3957
Male as a Percent of Total Doctorates	%	65.9	92.7	81.9	82.7	85.4	83.5	87.8	94.8	89.0	68.5	68.7	68.7	42.5	86.0	68.9
U.S. Citizenship	%	71.3	68.4	74.9	74.4	72.6	57.2	59.1	41.7	57.7	81.0	84.8	84.2	71.1	59.2	76.9
Non-U.S., Permanent Visa		4.3	3.1	4.6	4.7	4.1	4.1	5.8	9.4	6.4	2.7	2.5	2.5	5.9	3.8	3.1
Non-U.S., Temporary Visa		20.0	24.8	17.5	19.1	20.2	35.4	31.3	44.3	32.2	12.3	9.6	10.0	16.1	34.1	16.6
Unknown		4.3	3.7	3.0	1.8	3.0	3.3	3.9	4.6	3.7	4.1	3.2	3.3	6.9	2.8	3.5
Married	%	61.8	46.3	53.8	61.6	52.6	48.3	57.5	58.7	55.0	53.7	57.4	56.8	64.9	73.6	61.7
Not Married		32.1	48.8	41.7	35.8	43.1	47.4	37.5	34.6	39.6	41.7	37.4	38.1	26.9	22.0	33.2
Unknown		6.1	5.0	4.6	2.6	4.4	4.3	5.0	6.7	5.4	4.6	5.2	5.1	8.2	4.4	5.2
Median Age at Doctorate		32.3	29.5	28.8	31.8	29.5	30.3	31.1	30.8	30.2	29.3	30.6	30.4	32.0	32.1	30.9
Percent with Bacc in Same Field as Doctorate		58.3	80.4	84.5	54.5	78.0	76.5	16.2	75.6	74.4	28.2	64.9	59.2	30.8	60.0	57.2
Percent with Masters		78.5	64.6	38.0	74.2	53.2	71.2	88.4	88.9	71.3	26.7	55.3	50.8	75.7	92.0	63.1
Median Time Lapse From Bacc to Doct																
Total Time	Yrs	9.3	7.2	6.3	8.9	7.0	7.7	8.7	8.0	7.5	7.0	7.9	7.7	9.7	8.6	8.0
Registered Time		6.6	6.4	5.4	6.8	6.0	6.1	6.5	5.8	5.9	6.0	6.5	6.4	6.6	5.9	6.3
Postdoctoral Study Plans	%	22.4	49.9	47.3	33.9	45.8	17.3	7.3	16.4	29.4	77.6	62.7	65.0	19.0	21.3	50.5
Fellowship		9.9	14.8	19.5	12.2	16.7	7.0	1.5	4.0	9.9	44.1	34.9	36.3	11.8	5.8	26.8
Research Assoc		9.9	34.2	26.2	21.5	28.1	6.7	5.0	10.6	17.9	21.2	19.8	20.0	2.6	14.5	17.3
Traineeship		1.0	.4	.6	.0	.4	2.7	.4	1.4	1.1	2.4	1.8	1.9	1.6	.2	1.4
Other		1.7	.5	1.0	.2	.7	.9	.4	.4	.6	9.9	6.2	6.8	3.0	.8	5.0
Planned Employment After Doctorate	%	70.2	43.7	47.0	62.4	48.5	76.5	88.4	73.9	63.3	16.9	31.5	29.2	71.8	72.1	43.3
Educ Institution		39.2	11.5	8.3	25.4	12.3	55.8	42.1	27.0	23.5	4.3	15.5	13.7	31.1	36.3	20.7
Industry/Business		15.7	21.0	33.9	20.9	27.3	13.0	39.8	35.5	30.0	9.4	7.6	7.9	19.7	15.2	10.6
Government		8.2	8.7	3.1	11.4	6.4	5.5	3.1	8.6	7.1	.7	5.0	4.4	11.8	14.5	7.5
Nonprofit		4.2	.8	.6	1.2	.7	.9	1.5	.9	.9	1.7	2.1	2.0	5.9	1.8	2.3
Other & Unknown		2.8	.7	1.1	3.5	1.7	1.4	1.9	2.0	1.8	.7	1.3	1.2	3.3	4.3	2.2
Postdoct Status Unknown	%	7.4	6.5	5.7	3.7	5.7	6.2	4.2	9.6	7.3	5.5	5.8	5.8	9.2	6.5	6.2
Definite Postdoctoral Study		15.9	38.3	35.7	22.8	34.4	11.6	5.0	9.3	20.6	61.7	49.0	51.0	16.1	12.9	38.7
Seeking Postdoctoral Study		6.5	11.6	11.6	11.0	11.5	5.7	2.3	7.1	8.8	15.9	13.7	14.0	3.0	8.5	11.8
Definite Employment		51.5	30.2	37.0	48.4	36.6	57.7	69.9	53.3	46.8	12.0	21.3	19.8	55.1	49.3	29.9
Seeking Employment		18.8	13.5	10.0	14.0	11.9	18.8	18.5	20.7	16.5	4.8	10.2	9.4	16.7	22.8	13.3
Employment Activity After Doctorate																
Primary Activity																
R & D	%	32.3	68.9	77.0	58.9	70.6	44.5	60.8	62.4	63.2	78.0	50.9	53.5	45.2	59.8	54.9
Teaching		34.3	19.9	12.5	20.7	16.5	48.7	28.2	23.4	24.0	10.0	26.8	25.2	22.6	20.8	23.0
Administration		13.9	1.0	.6	3.3	1.3	.9	3.3	2.4	1.9	.0	3.6	3.2	11.3	3.5	4.5
Prof. Services		11.2	2.6	2.4	8.9	4.0	2.7	1.1	5.0	4.1	6.0	10.3	9.9	14.3	7.1	9.4
Other		2.7	1.7	1.9	4.5	2.4	.6	1.1	2.4	2.1	4.0	3.6	3.6	1.2	2.2	2.7
Activity Unknown		5.6	6.0	5.6	3.7	5.3	2.7	5.5	4.5	4.6	2.0	4.8	4.6	5.4	6.5	5.5
Secondary Activity																
R & D		24.3	15.2	9.4	20.7	13.6	39.2	23.8	22.3	21.2	8.0	27.9	26.0	23.2	18.6	22.5
Teaching		13.9	7.0	5.2	16.3	8.2	25.5	17.7	13.3	13.1	8.0	15.9	15.2	19.0	18.6	17.1
Administration		9.8	9.6	15.7	9.8	12.7	3.6	5.0	6.9	8.5	18.0	13.0	14.2	12.5	13.1	13.5
Prof. Services		6.4	4.6	5.1	5.3	5.0	3.9	3.3	4.4	4.5	8.0	5	5.9	11.3	4.7	6.2
Other		1.8	1.0	.2	2.4	.9	1.2	1.1	1.0	1.0	.0	.5	2.3	1.2	1.6	1.9
No Secondary Activity		38.1	56.6	58.8	41.9	54.3	24.0	43.6	47.6	47.1	56.0	29.4	31.9	27.4	36.9	33.3
Unknown		5.6	6.0	5.6	3.7	5.3	2.7	5.5	4.5	4.6	2.0	4.8	4.6	5.4	6.5	5.5
Region of Employment After Doctorate																
New England	%	6.1	8.9	3.4	2.8	4.8	8.0	10.5	6.5	6.3	14.0	4.8	5.7	3.0	1.6	3.6
Middle Atlantic		14.2	13.6	26.0	9.3	18.8	18.4	24.3	13.7	16.6	14.0	14.0	14.0	16.7	4.3	10.4
East No Central		12.6	9.3	20.2	8.5	14.5	11.3	9.4	11.5	12.4	18.0	11.9	12.5	8.3	8.6	10.3
West No Central		6.4	2.0	7.7	2.8	5.0	6.2	3.9	3.5	4.3	4.0	5.9	5.7	6.5	10.4	7.8
South Atlantic		14.6	12.9	14.0	11.8	13.2	16.9	11.0	13.0	13.4	12.0	17.4	16.9	19.6	10.6	14.7
East So Central		3.8	3.3	2.2	1.2	2.3	2.7	.6	2.7	2.4	4.0	2.7	2.8	4.2	3.3	3.2
West So Central		7.5	5.0	5.4	21.1	8.9	8.9	2.2	6.4	7.3	2.0	5.7	5.3	12.5	8.8	7.8
Mountain		4.8	8.6	2.1	10.2	5.7	4.2	5.0	6.0	5.7	2.0	6.9	6.5	4.2	5.5	5.7
Pacific & Insular		11.0	21.2	9.2	16.7	14.2	9.2	21.0	15.4	14.6	10.0	10.7	10.6	8.3	7.3	8.9
Foreign		12.3	10.6	4.7	11.8	7.9	9.8	7.2	16.2	12.1	12.0	15.9	15.6	12.5	35.3	23.3
Region Unknown		6.6	4.6	5.1	3.7	4.6	4.5	5.0	5.1	4.9	8.0	4.0	4.4	4.2	4.3	4.3

1/Refer to explanatory note on page 25 and the description of doctoral fields inside back cover.

TABLE 2 (Continued)

Doctorates: Men

Psychology	Economics	Anthropology and Sociology	Political Sci. and International Rel.	Other Social Sciences	Social Sciences Incl. Psychology	Total Sciences	History	Eng. and Amer. Lang. and Lit.	Foreign Lang. and Lit.	Other Humanities	Humanities	Business and Management	Other Professional Fields	Education	Total Non-Sciences	Other or Unspecified 2/
1609	671	453	404	351	3488	14005	410	325	218	989	1942	689	624	3323	6578	10
49.9	84.4	53.3	78.6	68.4	59.2	73.7	66.6	44.3	44.3	58.7	55.0	79.3	59.5	49.0	53.8	50.0
88.6	52.9	79.0	65.1	60.7	75.0	67.4	86.6	83.7	73.9	82.2	82.4	61.7	74.8	82.7	79.7	
1.7	8.9	2.4	6.7	3.7	4.0	4.9	2.9	3.1	10.1	2.4	3.5	8.3	2.6	2.0	3.2	
3.2	33.7	13.7	20.0	29.1	15.0	23.5	5.6	8.0	10.1	9.9	8.7	24.8	17.1	11.5	12.6	
6.5	4.5	4.9	8.2	6.6	6.1	4.2	4.9	5.2	6.0	5.5	5.4	5.2	5.4	3.8	4.6	
57.6	60.4	59.4	55.0	67.0	59.0	57.9	62.0	59.1	53.2	60.0	59.5	66.3	71.0	77.2	70.2	
34.4	33.4	34.4	34.2	23.4	33.1	36.2	31.2	33.2	37.6	33.0	33.2	25.5	20.2	17.7	23.3	
8.0	6.3	6.2	10.9	9.7	7.9	5.9	6.8	7.7	9.2	7.1	7.4	8.1	8.8	5.1	6.4	
32.1	31.5	34.0	33.4	34.5	32.5	30.9	34.6	33.5	34.7	34.4	34.2	34.5	36.2	37.9	36.4	
68.4	61.5	61.1	66.9	25.6	60.5	66.1	66.1	72.0	57.8	55.8	60.9	39.9	21.6	34.5	41.7	
79.5	76.5	87.0	88.9	91.2	82.1	71.7	91.0	88.9	89.4	88.0	88.9	89.0	94.2	95.8	92.9	
9.1	8.7	10.7	9.9	11.1	9.6	8.1	11.7	10.4	11.2	11.1	11.2	11.2	12.6	14.2	12.8	
6.8	6.3	8.3	7.2	7.1	7.0	6.2	8.9	7.9	8.2	7.8	8.1	6.8	7.6	7.7	7.7	
17.5	6.1	12.8	5.9	9.4	12.6	31.2	6.8	3.4	5.5	6.5	5.9	2.2	2.4	3.1	3.8	
9.9	2.5	7.9	3.2	4.3	6.9	13.9	4.1	1.8	3.2	2.5	2.8	.3	.5	.9	1.4	
3.5	2.4	3.8	1.2	4.3	3.1	14.1	.7	.0	1.4	1.4	1.0	1.0	.5	1.0	.9	
2.7	.7	.0	.0	.9	1.5	1.3	.2	.3	.0	.2	.2	.7	1.0	.3	.4	
1.4	.4	1.1	1.5	.0	1.0	1.9	1.7	1.2	.9	2.3	1.9	.1	.5	.9	1.0	
74.1	86.4	79.0	81.7	79.2	78.5	61.4	83.4	88.9	83.5	83.8	84.6	90.0	89.1	91.2	88.9	
25.1	55.9	52.1	56.2	46.7	40.3	26.9	59.8	75.1	72.5	64.3	66.1	72.7	51.0	66.3	65.4	
16.5	8.9	7.1	6.2	9.7	11.9	20.0	5.9	6.8	3.2	5.8	5.7	11.5	7.4	6.2	6.7	
12.7	14.8	7.7	9.7	13.1	12.1	8.5	7.8	2.2	2.8	2.0	3.3	3.0	9.1	10.9	7.7	
15.5	1.9	8.4	3.5	3.7	9.4	3.4	4.6	1.5	1.8	8.2	5.6	.9	17.0	5.1	5.9	
4.4	4.9	3.8	6.2	6.0	4.8	2.6	5.4	3.4	3.2	3.8	3.9	1.9	4.6	2.8	3.2	
8.3	7.5	8.2	12.4	11.4	8.9	7.4	9.8	7.7	11.0	9.7	9.5	7.8	8.5	5.7	7.3	
11.6	3.3	7.5	2.5	2.8	7.5	22.5	2.9	2.5	2.3	3.2	2.9	1.0	1.3	1.7	1.9	
5.9	2.8	5.3	3.5	6.6	5.0	8.7	3.9	.9	3.2	3.2	3.0	1.2	1.1	1.4	1.8	
51.3	68.9	48.1	55.4	55.6	55.2	44.1	50.5	55.4	56.0	55.4	54.4	78.4	71.2	71.3	67.1	
22.8	17.6	30.9	26.2	23.6	23.3	17.3	32.9	33.5	27.5	28.4	30.1	11.6	17.9	19.9	21.9	
16.8	38.3	31.2	17.4	28.2	24.8	49.7	14.0	.6	5.7	7.1	7.2	22.4	7.2	5.2	8.0	
16.2	43.1	44.5	53.6	43.6	33.0	26.6	55.1	80.6	81.1	65.3	67.7	61.7	48.6	30.3	45.0	
5.0	3.2	10.6	11.2	11.8	6.6	3.8	12.6	7.2	4.9	6.9	7.9	7.2	16.4	44.0	28.1	
55.6	4.3	5.0	4.0	8.2	26.8	12.2	8.7	2.8	.8	8.6	6.7	3.3	15.8	11.5	9.8	
1.6	4.1	1.8	4.0	4.6	2.8	2.4	4.3	3.9	2.5	4.9	4.4	2.0	4.5	2.2	2.9	
4.8	6.9	6.9	9.8	3.6	6.0	5.2	5.3	5.0	4.9	7.1	6.1	3.3	7.4	6.7	6.2	
21.5	39.6	36.7	37.9	32.8	30.6	24.4	26.1	33.9	45.9	29.9	31.7	49.1	27.5	14.5	24.1	
16.5	19.7	14.7	9.8	11.8	15.8	14.7	9.7	4.4	6.6	10.4	8.8	19.4	12.8	13.1	12.8	
14.6	4.3	13.3	8.5	9.7	10.8	10.2	13.5	6.7	7.4	9.3	9.5	5.0	14.2	9.2	9.2	
7.1	3.0	3.2	5.8	6.7	5.5	5.1	5.3	2.2	3.3	5.1	4.4	3.3	7.7	10.9	8.1	
3.0	.9	2.3	2.2	.5	2.1	1.5	1.4	2.8	1.6	5.1	3.6	1.7	2.3	1.9	2.3	
32.3	25.5	22.9	25.9	34.9	29.1	38.9	38.6	45.0	30.3	33.0	35.9	18.1	28.2	43.7	37.1	
4.8	6.9	6.9	9.8	3.6	6.0	5.2	5.3	5.0	4.9	7.1	6.1	3.3	7.4	6.7	6.2	
8.2	6.9	8.7	4.5	3.6	7.1	6.0	8.7	7.8	9.0	6.8	7.6	6.3	4.7	6.0	6.3	
17.3	13.0	13.3	14.7	11.3	14.9	14.9	16.4	18.9	14.8	14.2	15.5	9.6	12.4	13.4	13.3	
13.7	13.6	15.1	9.8	10.8	13.1	12.2	13.5	10.6	13.9	13.3	13.0	14.3	14.6	12.7	13.1	
7.4	5.4	4.1	6.7	3.6	6.1	5.5	4.8	7.8	7.4	8.0	7.3	3.9	7.7	8.4	7.5	
13.0	21.6	14.2	19.2	13.3	15.9	14.4	14.5	16.1	14.8	13.9	14.5	15.4	11.9	15.3	14.8	
3.4	3.0	4.1	1.3	3.6	3.2	2.8	5.8	7.2	1.6	3.6	4.4	5.2	5.9	5.6	5.3	
7.5	5.2	6.9	5.4	4.1	6.3	7.1	8.7	6.7	9.8	8.0	8.1	12.0	8.8	7.0	8.1	
5.4	1.9	6.0	2.7	4.1	4.2	5.2	1.0	1.1	4.1	2.4	2.1	3.7	1.4	5.7	4.2	
13.4	6.3	8.7	12.1	12.8	11.0	12.4	11.6	7.8	8.2	11.5	10.5	10.7	8.3	8.3	9.1	
2.5	18.4	13.3	18.9	22.1	10.8	13.8	7.2	6.7	11.5	10.2	9.2	13.7	16.2	8.8	10.2	
8.1	4.5	5.5	10.7	10.8	7.5	5.6	7.7	9.4	4.9	8.0	7.9	5.2	8.1	8.8	8.0	

2/Statistics are not presented for this group because too few records contained the specified data.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

TABLE 2 Statistical Profile of Doctorate Recipients by Field of Doctorate, 1984[1/]

Doctorates: Women

	1984 Total	Physics and Astronomy	Chemistry	Earth, Atmospheric and Marine Sciences	Physical Sciences	Mathematics	Computer Sciences	Engineering	EMP Fields	Biochemistry	Other Biosciences	Biosciences	Health Sciences	Agricultural Sciences	Life Sciences
Total Female	10660	79	320	106	505	115	36	152	808	191	1022	1213	413	162	1788
Female as a Percent of Total Doctorates %	34.1	7.3	18.1	17.3	14.6	16.5	12.2	5.2	11.0	31.5	31.3	31.3	57.5	14.0	31.1
U.S. Citizenship %	86.9	68.4	77.8	90.6	79.0	63.5	66.7	58.6	72.4	85.3	86.1	86.0	87.9	67.9	84.8
Non-U.S., Permanent Visa	3.1	6.3	5.0	.9	4.4	10.4	5.6	8.6	6.1	7.9	3.2	4.0	4.1	3.7	4.0
Non-U.S., Temporary Visa	6.5	22.8	14.1	8.5	14.3	21.7	22.2	28.3	18.3	5.8	8.0	7.7	6.3	27.2	9.1
Unknown	3.5	2.5	3.1	.0	2.4	4.3	5.6	4.6	3.2	1.0	2.6	2.4	1.7	1.2	2.1
Married %	51.9	50.6	46.3	50.0	47.7	50.4	55.6	56.6	50.1	49.7	46.8	47.2	53.3	54.9	49.3
Not Married	43.5	44.3	50.6	48.1	49.1	43.5	38.9	38.8	45.9	46.6	49.8	49.3	43.6	43.2	47.4
Unknown	4.6	5.1	3.1	1.9	3.2	6.1	5.6	4.6	4.0	3.7	3.4	3.5	3.1	1.9	3.2
Median Age at Doctorate	34.8	30.4	28.3	31.0	29.1	30.0	33.8	29.8	29.5	29.0	30.4	30.3	35.1	29.8	31.0
Percent with Bacc in Same Field as Doctorate	53.0	77.2	84.1	50.9	76.0	80.9	11.1	52.0	69.3	18.8	68.5	60.7	62.7	48.8	60.1
Percent with Masters	84.2	75.9	40.3	72.6	52.7	79.1	97.2	86.2	64.7	38.2	54.6	52.0	89.6	90.1	64.1
Median Time Lapse From Bacc to Doct															
Total Time Yrs	11.6	7.7	6.2	8.7	6.8	7.8	10.8	7.4	7.1	6.9	8.2	8.0	11.9	7.6	8.5
Registered Time	7.1	6.9	5.4	6.3	5.8	6.2	6.2	5.5	5.9	6.0	6.4	6.3	6.6	6.0	6.3
Postdoctoral Study Plans %	16.8	53.2	45.3	36.8	44.8	10.4	13.9	15.8	33.0	81.2	68.3	70.3	14.0	21.6	52.9
Fellowship	9.3	19.0	19.1	9.4	17.0	6.1	2.8	7.9	13.1	52.4	43.9	45.3	8.7	6.2	33.3
Research Assoc	5.2	34.2	25.0	26.4	26.7	4.3	11.1	7.2	19.2	21.5	19.8	20.0	3.6	13.0	15.6
Traineeship	1.1	.0	.6	.0	.4	.0	.0	.7	.4	2.1	1.3	1.4	.5	1.9	1.2
Other	1.2	.0	.6	.9	.6	.0	.0	.0	.4	5.2	3.3	3.6	1.2	.6	2.8
Planned Employment															
After Doctorate %	76.8	40.5	47.8	61.3	49.5	81.7	80.6	77.6	60.8	12.6	25.6	23.6	80.9	74.7	41.4
Educ Institution	48.8	16.5	7.5	26.4	12.9	70.4	52.8	27.6	25.6	3.7	13.4	11.9	53.3	40.1	24.0
Industry/Business	10.5	15.2	34.4	17.9	27.9	7.0	13.9	39.5	26.5	5.2	5.9	5.8	9.4	21.0	8.0
Government	6.4	3.8	5.0	15.1	6.9	1.7	2.8	7.9	6.2	3.1	3.0	3.1	8.5	8.0	4.8
Nonprofit	5.7	1.3	.0	.0	.2	1.7	8.3	.7	.9	.0	.7	.6	5.8	.0	1.7
Other & Unknown	5.5	3.8	.9	1.9	1.6	.9	2.8	2.0	1.6	.5	2.6	2.3	3.9	5.6	3.0
Postdoct Status Unknown %	6.4	6.3	6.9	1.9	5.7	7.8	5.6	6.6	6.2	6.3	6.1	6.1	5.1	3.7	5.6
Definite Postdoctoral Study	11.4	39.2	32.8	21.7	31.5	7.0	11.1	8.6	22.8	63.4	53.4	55.0	8.2	8.0	39.9
Seeking Postdoctoral Study	5.5	13.9	12.5	15.1	13.3	3.5	2.8	7.2	10.3	17.8	14.9	15.3	5.8	13.6	13.0
Definite Employment	52.0	26.6	33.4	43.4	34.5	61.7	66.7	52.0	43.1	8.9	15.9	14.8	58.8	37.7	27.1
Seeking Employment	24.8	13.9	14.4	17.9	15.0	20.0	13.9	25.7	17.7	3.7	9.7	8.7	22.0	37.0	14.4
Employment Activity After Doctorate															
Primary Activity															
R & D %	15.4	66.7	82.2	43.5	70.1	29.6	50.0	58.2	57.8	52.9	41.1	42.2	24.7	63.9	36.2
Teaching	43.7	28.6	10.3	41.3	20.7	64.8	37.5	30.4	33.0	23.5	39.3	37.8	48.1	26.2	41.5
Administration	16.2	.0	.9	2.2	1.1	.0	4.2	1.3	1.1	5.9	3.7	3.9	11.1	1.6	7.2
Prof. Services	16.6	.0	3.7	8.7	4.6	1.4	.0	3.8	3.4	5.9	9.8	9.4	12.8	3.3	10.3
Other	2.5	.0	.9	.0	.6	.0	4.2	2.5	1.1	5.9	1.8	2.2	.0	1.6	1.0
Activity Unknown	5.6	4.8	1.9	4.3	2.9	4.2	4.2	3.8	3.4	5.9	4.3	4.4	3.3	3.3	3.7
Secondary Activity															
R & D	26.2	23.8	6.5	41.3	17.8	46.5	41.7	24.1	26.7	11.8	28.2	26.7	39.5	24.6	32.9
Teaching	11.8	14.3	.9	13.0	5.7	16.9	20.8	8.9	9.8	.0	14.7	13.3	10.7	16.4	12.4
Administration	8.9	4.8	14.0	.0	9.2	4.2	.0	7.6	7.2	23.5	7.4	8.9	12.8	8.2	10.7
Prof. Services	8.1	9.5	3.7	8.7	5.7	5.6	.0	2.5	4.6	5.9	4.3	4.4	6.2	4.9	5.4
Other	2.6	.0	.0	.0	.0	1.4	.0	.0	.3	.0	1.8	1.7	2.	3.3	2.1
No Secondary Activity	36.9	42.9	72.9	32.6	58.6	21.1	33.3	53.2	48.0	52.9	39.3	40.6	25.5	39.3	32.9
Unknown	5.6	4.8	1.9	4.3	2.9	4.2	4.2	3.8	3.4	5.9	4.3	4.4	3.3	3.3	3.7
Region of Employment After Doctorate															
New England %	6.6	14.3	6.5	2.2	6.3	11.3	12.5	3.8	7.2	5.9	5.5	5.6	5.8	1.6	5.2
Middle Atlantic	16.3	9.5	27.1	8.7	20.1	26.8	12.5	20.3	21.0	11.8	18.4	17.8	13.6	9.8	14.7
East No Central	12.3	4.8	21.5	4.3	14.9	5.6	4.2	13.9	12.1	11.8	10.4	10.6	13.2	8.2	11.6
West No Central	5.9	.0	5.6	4.3	4.6	5.6	4.2	3.8	4.6	5.9	6.1	6.1	5.3	13.1	6.6
South Atlantic	15.5	19.0	15.9	13.0	15.5	11.3	4.2	13.9	13.5	23.5	12.9	13.9	17.7	13.1	15.7
East So Central	4.4	.0	1.9	8.7	3.4	5.6	8.3	1.3	3.7	11.8	3.7	4.4	5.3	.0	4.3
West So Central	8.1	.0	3.7	19.6	7.5	9.9	8.3	2.5	6.9	5.9	4.9	5.0	8.2	4.9	6.6
Mountain	4.8	9.5	3.7	10.9	6.3	1.4	12.5	3.8	5.2	.0	3.1	2.8	4.5	6.6	4.1
Pacific & Insular	11.3	23.8	6.5	19.6	12.1	16.9	20.8	15.2	14.4	11.8	12.9	12.8	11.9	13.1	12.4
Foreign	4.9	14.3	2.8	8.7	5.7	5.6	8.3	16.5	8.3	5.9	14.1	13.3	6.2	24.6	11.2
Region Unknown	10.0	4.8	4.7	.0	3.4	.0	4.2	5.1	3.2	5.9	8.0	7.8	8.2	4.9	7.6

1/Refer to explanatory note on page 25 and the description of doctoral fields inside back cover.

TABLE 2 (Continued)

Doctorates: Women

Psychology	Economics	Anthropology and Sociology	Political Sci. and International Rel.	Other Social Sciences	Social Sciences Incl. Psychology	Total Sciences	History	Eng. and Amer. Lang. and Lit.	Foreign Lang. and Lit.	Other Humanities	Humanities	Business and Management	Other Professional Fields	Education	Total Non-Sciences	Other or Unspecified 2/
1614	124	397	110	162	2407	5003	206	409	274	697	1586	180	424	3457	5647	10
50.1	15.6	46.7	21.4	31.6	40.8	26.3	33.4	55.7	55.7	41.3	45.0	20.7	40.5	51.0	46.2	50.0
91.6	72.6	86.4	81.6	82.7	88.7	84.7	90.8	91.9	70.4	85.4	85.2	85.0	87.5	90.8	88.8	
1.5	6.5	2.8	5.5	3.7	2.3	3.5	2.9	2.2	11.7	4.0	4.7	3.3	2.1	1.8	2.7	
2.2	18.5	7.1	9.1	9.3	4.6	8.4	2.4	2.4	9.5	5.9	5.2	8.3	5.7	4.5	4.9	
4.7	2.4	3.8	3.6	4.3	4.4	3.4	3.9	3.4	8.4	4.7	4.9	3.3	4.7	2.9	3.6	
48.8	50.0	49.4	55.5	46.3	49.1	49.3	58.7	50.9	55.1	44.3	49.7	51.7	49.3	56.8	54.1	
45.9	46.0	45.1	37.3	48.8	45.6	46.3	35.0	44.3	35.8	49.4	43.8	41.7	43.9	39.5	41.1	
5.3	4.0	5.5	7.3	4.9	5.4	4.4	6.3	4.9	9.1	6.3	6.4	6.7	6.8	3.7	4.8	
32.7	30.7	34.5	32.7	35.2	33.1	31.7	36.6	35.8	34.7	34.3	35.0	34.2	37.9	39.0	37.6	
62.6	64.5	52.1	59.1	13.0	57.5	60.3	63.1	72.9	54.4	52.4	59.4	32.8	22.4	44.5	46.7	
80.8	72.6	88.4	86.4	93.2	82.7	73.2	89.8	86.8	87.6	86.9	87.4	86.7	95.5	97.0	93.9	
9.4	8.3	11.4	10.2	12.8	9.9	8.9	13.2	12.7	11.3	11.6	11.9	10.7	14.2	15.1	14.1	
6.9	6.4	8.4	7.6	7.8	7.2	6.6	8.9	8.2	8.5	8.1	8.3	6.7	7.2	7.5	7.7	
17.1	5.6	15.4	4.5	9.3	15.1	31.5	8.3	2.9	5.5	6.2	5.5	.6	3.1	3.4	3.8	
9.4	2.4	9.6	.9	6.8	8.5	18.1	4.4	1.7	2.9	3.2	2.9	.0	1.4	1.0	1.5	
2.7	3.2	3.8	.0	1.9	2.7	10.0	1.5	.2	1.5	1.3	1.1	.0	.7	1.1	1.0	
3.7	.0	.8	.9	.0	2.7	1.8	.0	.2	.4	.4	.3	.0	.2	.5	.4	
1.2	.0	1.3	2.7	.6	1.2	1.6	2.4	.7	.7	1.3	1.2	.6	.7	.8	.8	
76.6	90.3	77.1	84.5	84.6	78.3	62.3	82.5	90.0	82.8	84.5	85.4	92.8	89.2	91.5	89.7	
28.4	58.1	46.1	61.8	40.7	35.2	29.7	55.8	76.0	55.3	66.1	67.2	80.0	57.8	65.3	65.7	
17.1	11.3	7.8	6.4	14.2	14.6	14.2	5.3	5.4	6.6	7.0	6.3	7.8	10.8	7.2	7.2	
8.4	9.7	6.0	9.1	9.3	8.1	6.6	8.3	1.0	2.6	2.4	2.8	1.7	5.2	8.0	6.2	
15.5	3.2	9.1	1.8	6.8	12.6	6.8	4.9	1.2	2.2	3.4	2.8	1.1	9.4	5.1	4.6	
7.2	8.1	8.1	5.5	13.6	7.7	5.0	8.3	6.4	6.2	5.5	6.2	2.2	5.9	6.0	5.9	
6.3	4.0	7.6	10.9	6.2	6.6	6.2	9.2	7.1	11.7	9.3	9.1	6.7	7.8	5.1	6.5	
10.8	4.0	8.6	2.7	4.3	9.3	22.4	4.4	1.0	1.5	2.3	2.1	.0	1.9	1.4	1.6	
6.3	1.6	6.8	1.8	4.9	5.8	9.1	3.9	2.0	4.0	3.9	3.4	.6	1.2	1.9	2.2	
49.7	70.2	50.4	50.0	58.6	51.5	41.4	44.7	55.3	51.5	53.1	52.3	76.1	65.1	64.5	61.5	
26.9	20.2	26.7	34.5	25.9	26.8	20.9	37.9	34.7	31.4	31.4	33.1	16.7	24.1	27.0	28.2	
15.3	41.4	29.5	18.2	24.2	20.3	30.3	9.8	2.7	5.7	7.6	6.2	22.6	8.0	5.4	6.5	
16.7	43.7	43.0	69.1	44.2	27.3	31.6	63.0	77.0	76.6	71.1	72.7	62.8	55.4	41.4	50.8	
5.9	2.3	9.5	3.6	14.7	6.8	5.9	9.8	8.8	3.5	8.4	7.8	4.4	14.1	30.0	22.4	
55.7	3.4	8.0	3.6	7.4	38.3	25.9	6.5	4.9	4.3	4.3	4.7	2.9	11.6	13.9	11.1	
1.5	3.4	3.5	.0	3.2	2.0	1.6	4.3	4.0	3.5	3.0	3.5	1.5	4.3	2.7	3.0	
4.9	5.7	6.5	5.5	6.3	5.3	4.6	6.5	2.7	6.4	5.7	5.1	5.8	6.5	6.7	6.3	
20.9	37.9	37.5	58.2	38.9	27.8	28.8	31.5	33.2	41.8	33.5	34.6	48.2	39.1	17.6	24.6	
16.7	14.9	13.5	5.5	9.5	15.0	13.5	4.3	7.5	3.5	9.5	7.4	20.4	13.4	11.0	10.7	
7.6	3.4	6.5	5.5	5.3	6.9	7.8	9.8	8.8	5.0	6.8	7.4	1.5	9.1	10.9	9.6	
8.1	5.7	5.0	3.6	9.5	7.3	6.4	3.3	4.0	.0	4.1	3.3	5.1	8.3	11.5	9.0	
2.6	1.1	.5	1.8	2.1	2.1	1.8	2.2	3.1	4.3	6.5	4.7	1.5	2.2	2.7	3.1	
39.2	31.0	30.5	20.0	28.4	35.5	37.0	42.4	40.7	39.0	34.1	37.6	17.5	21.4	39.6	36.8	
4.9	5.7	6.5	5.5	6.3	5.3	4.6	6.5	2.7	6.4	5.7	5.1	5.8	6.5	6.7	6.3	
6.4	12.6	7.0	7.3	10.5	7.3	6.8	10.9	7.5	17.7	7.3	9.5	5.8	4.3	5.7	6.5	
21.6	20.7	19.0	16.4	16.8	20.5	19.2	15.2	15.9	18.4	18.6	17.5	12.4	13.4	13.7	14.5	
12.1	5.7	10.5	10.9	9.5	11.1	11.4	10.9	19.5	10.6	12.2	13.8	13.1	17.0	11.9	12.8	
5.9	1.1	3.5	5.5	4.2	5.0	5.3	4.3	4.4	5.0	7.6	5.9	5.8	6.5	6.5	6.3	
14.2	21.8	13.5	14.5	24.2	15.4	15.2	13.0	14.6	13.5	14.1	14.0	16.1	10.9	16.9	15.7	
2.9	2.3	1.0	1.8	1.1	2.3	3.0	4.3	3.1	2.1	3.8	3.4	5.8	7.6	5.5	5.2	
7.2	5.7	5.5	9.1	4.2	6.7	6.7	8.7	8.4	1.4	5.9	6.2	16.1	11.2	9.1	8.9	
3.5	5.7	6.5	7.3	1.1	4.1	4.3	6.5	3.1	4.3	3.0	3.6	4.4	4.0	5.7	5.0	
13.8	6.9	13.0	10.9	11.6	12.9	13.0	16.3	8.0	9.9	13.0	11.5	13.1	12.3	9.5	10.3	
1.6	8.0	7.0	9.1	6.3	3.6	6.2	4.3	2.7	4.3	7.0	5.1	3.6	5.8	3.5	4.1	
10.8	9.2	13.5	7.3	10.5	11.0	8.9	5.4	12.8	12.8	7.6	9.7	3.6	6.9	11.9	10.7	

2/Statistics are not presented for this group because too few records contained the specified data.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

TABLE 3 Sources of Support in Graduate School of Doctorate Recipients by Sex and Summary Field, 1984

Sources of Support in Graduate School		Total	Field of Doctorate: Physical Sciences[1]	Engineering	Life Sciences	Social Sciences	Humanities	Prof. Fields	Education
		Men/Women	Men/Women	Men/Women	Men/Women	Men/Women	Men/Women	Men/Women	Men/Women
NSF Fellowship	N	422/ 168	163/ 37	69/ 7	94/ 52	74/ 49	6/ 13	5/ 0	10/ 10
	V%[2]	2.2/ 1.7	4.5/ 5.9	2.7/ 4.8	2.5/ 3.0	2.3/ 2.2	.3/ .9	.4/ .0	.3/ .3
	H%[2]	100.0/100.0	38.6/ 22.0	16.4/ 4.2	22.3/ 31.0	17.5/ 29.2	1.4/ 7.7	1.2/ .0	2.4/ 6.0
NIH Traineeship	N	1045/ 688	72/ 16	29/ 2	732/ 425	193/ 213	2/ 3	8/ 12	9/ 17
	V%	5.4/ 6.8	2.0/ 2.5	1.1/ 1.4	19.5/ 24.7	6.0/ 9.4	.1/ .2	.7/ 2.1	.3/ .5
	H%	100.0/100.0	6.9/ 2.3	2.8/ .3	70.0/ 61.8	18.5/ 31.0	.2/ .4	.8/ 1.7	.9/ 2.5
Other Department of Health & Human Servs.[3]	N	223/ 277	10/ 5	9/ 0	66/ 77	106/ 154	1/ 2	16/ 24	15/ 15
	V%	1.2/ 2.7	.3/ .8	.3/ .0	1.8/ 4.5	3.3/ 6.8	.1/ .1	1.3/ 4.3	.5/ .5
	H%	100.0/100.0	4.5/ 1.8	4.0/ .0	29.6/ 27.8	47.5/ 55.6	.4/ .7	7.2/ 8.7	6.7/ 5.4
Graduate & Prof. Opportunities Program	N	51/ 45	3/ 5	4/ 4	11/ 12	14/ 7	5/ 5	5/ 1	9/ 11
	V%	.3/ .4	.1/ .8	.2/ 2.7	.3/ .7	.4/ .3	.3/ .3	.4/ .2	.3/ .3
	H%	100.0/100.0	5.9/ 11.1	7.8/ 8.9	21.6/ 26.7	27.5/ 15.6	9.8/ 11.1	9.8/ 2.2	17.6/ 24.4
Other Department of Education[4]	N	163/ 142	4/ 1	5/ 0	7/ 6	46/ 26	64/ 49	1/ 5	36/ 55
	V%	.8/ 1.4	.1/ .2	.2/ .0	.2/ .3	1.4/ 1.1	3.6/ 3.3	.1/ .9	1.1/ 1.7
	H%	100.0/100.0	2.5/ .7	3.1/ .0	4.3/ 4.2	28.2/ 18.3	39.3/ 34.5	.6/ 3.5	22.1/ 38.7
GI Bill	N	1120/ 89	102/ 2	64/ 1	154/ 13	240/ 40	139/ 10	122/ 5	298/ 18
	V%	5.8/ .9	2.8/ .3	2.5/ .7	4.1/ .8	7.5/ 1.8	7.7/ .7	10.2/ .9	9.5/ .5
	H%	100.0/100.0	9.1/ 2.2	5.7/ 1.1	13.8/ 14.6	21.4/ 44.9	12.4/ 11.2	10.9/ 5.6	26.6/ 20.2
Other Federal Support	N	891/ 489	146/ 36	120/ 10	200/ 115	185/ 148	100/ 79	40/ 11	98/ 90
	V%	4.6/ 4.8	4.0/ 5.7	4.7/ 6.8	5.3/ 6.7	5.8/ 6.5	5.6/ 5.3	3.3/ 2.0	3.1/ 2.7
	H%	100.0/100.0	16.4/ 7.4	13.5/ 2.0	22.4/ 23.5	20.8/ 30.3	11.2/ 16.2	4.5/ 2.2	11.0/ 18.4
Nat'l Fellowship (non-federal)	N	777/ 616	139/ 37	89/ 15	131/ 94	189/ 144	138/ 198	53/ 41	38/ 87
	V%	4.0/ 6.1	3.8/ 5.9	3.5/ 10.3	3.5/ 5.5	5.9/ 6.3	7.7/ 13.4	4.4/ 7.3	1.2/ 2.6
	H%	100.0/100.0	17.9/ 6.0	11.5/ 2.4	16.9/ 15.3	24.3/ 23.4	17.8/ 32.1	6.8/ 6.7	4.9/ 14.1
Teaching Assistantship	N	9432/ 4487	2560/ 468	1062/ 56	1520/ 720	1808/ 1126	1205/ 1041	605/ 273	666/ 797
	V%	48.8/ 44.3	70.4/ 74.2	41.2/ 38.4	40.5/ 41.9	56.3/ 49.6	67.1/ 70.4	50.4/ 48.6	21.1/ 24.1
	H%	100.0/100.0	27.1/ 10.4	11.3/ 1.2	16.1/ 16.0	19.2/ 25.1	12.8/ 23.2	6.4/ 6.1	7.1/ 17.8
Research Assistantship	N	8865/ 3115	2627/ 435	1894/ 109	2063/ 817	1241/ 831	256/ 217	339/ 164	443/ 536
	V%	45.9/ 30.7	72.2/ 68.9	73.5/ 74.7	55.0/ 47.6	38.7/ 36.6	14.2/ 14.7	28.3/ 29.2	14.1/ 16.2
	H%	100.0/100.0	29.6/ 14.0	21.4/ 3.5	23.3/ 26.2	14.0/ 26.7	2.9/ 7.0	3.8/ 5.3	5.0/ 17.2
University Fellowship	N	3878/ 2086	807/ 164	423/ 29	706/ 372	776/ 521	642/ 571	252/ 116	268/ 312
	V%	20.1/ 20.6	22.2/ 26.0	16.4/ 19.9	18.8/ 21.7	24.2/ 22.9	35.7/ 38.6	21.0/ 20.6	8.5/ 9.4
	H%	100.0/100.0	20.8/ 7.9	10.9/ 1.4	18.2/ 17.8	20.0/ 25.0	16.6/ 27.4	6.5/ 5.6	6.9/ 15.0
College Work-Study	N	603/ 429	69/ 19	47/ 3	124/ 72	160/ 143	90/ 94	32/ 10	81/ 87
	V%	3.1/ 4.2	1.9/ 3.0	1.8/ 2.1	3.3/ 4.2	5.0/ 6.3	5.0/ 6.4	2.7/ 1.8	2.6/ 2.6
	H%	100.0/100.0	11.4/ 4.4	7.8/ .7	20.6/ 16.8	26.5/ 33.3	14.9/ 21.9	5.3/ 2.3	13.4/ 20.3
Other University Related	N	1124/ 938	130/ 37	95/ 10	218/ 145	225/ 235	133/ 157	87/ 42	235/ 311
	V%	5.8/ 9.3	3.6/ 5.9	3.7/ 6.8	5.8/ 8.4	7.0/ 10.3	7.4/ 10.6	7.3/ 7.5	7.5/ 9.4
	H%	100.0/100.0	11.6/ 3.9	8.5/ 1.1	19.4/ 15.5	20.0/ 25.1	11.8/ 16.7	7.7/ 4.5	20.9/ 33.2
Business/Employer Funds	N	907/ 414	125/ 35	172/ 7	122/ 61	89/ 64	60/ 29	93/ 25	246/ 193
	V%	4.7/ 4.1	3.4/ 5.5	6.7/ 4.8	3.3/ 3.6	2.8/ 2.8	3.3/ 2.0	7.8/ 4.4	7.8/ 5.8
	H%	100.0/100.0	13.8/ 8.5	19.0/ 1.7	13.5/ 14.7	9.8/ 15.5	6.6/ 7.0	10.3/ 6.0	27.1/ 46.6
Own Earnings	N	10953/ 6861	1285/ 213	942/ 64	1664/ 831	2175/ 1572	1349/ 1028	849/ 401	2683/ 2743
	V%	56.7/ 67.7	35.3/ 33.8	36.6/ 43.8	44.4/ 48.4	67.8/ 69.2	75.1/ 69.5	70.8/ 71.4	85.2/ 82.8
	H%	100.0/100.0	11.7/ 3.1	8.6/ .9	15.2/ 12.1	19.9/ 22.9	12.3/ 15.0	7.8/ 5.8	24.5/ 40.0
Spouse's Earnings	N	5651/ 3558	813/ 136	406/ 45	1202/ 499	1052/ 807	680/ 548	384/ 214	1110/ 1307
	V%	29.2/ 35.1	22.4/ 21.6	15.8/ 30.8	32.1/ 29.0	32.8/ 35.5	37.8/ 37.1	32.0/ 38.1	35.2/ 39.5
	H%	100.0/100.0	14.4/ 3.8	7.2/ 1.3	21.3/ 14.0	18.6/ 22.7	12.0/ 15.4	6.8/ 6.0	19.6/ 36.7
Family Support	N	4417/ 2332	755/ 118	654/ 29	854/ 401	879/ 662	511/ 459	278/ 120	482/ 540
	V%	22.9/ 23.0	20.8/ 18.7	25.4/ 19.9	22.8/ 23.3	27.4/ 29.1	28.4/ 31.0	23.2/ 21.4	15.3/ 16.3
	H%	100.0/100.0	17.1/ 5.1	14.8/ 1.2	19.3/ 17.2	19.9/ 28.4	11.6/ 19.7	6.3/ 5.1	10.9/ 23.2
Guaranteed Student Loans	N	3311/ 2122	408/ 81	201/ 8	680/ 324	842/ 649	348/ 265	242/ 137	589/ 658
	V%	17.1/ 20.9	11.2/ 12.8	7.8/ 5.5	18.1/ 18.9	26.2/ 28.6	19.4/ 17.9	20.2/ 24.4	18.7/ 19.9
	H%	100.0/100.0	12.3/ 3.8	6.1/ .4	20.5/ 15.3	25.4/ 30.6	10.5/ 12.5	7.3/ 6.5	17.8/ 31.0
National Direct Student Loans	N	1443/ 1035	127/ 24	59/ 6	253/ 127	473/ 383	223/ 189	93/ 46	212/ 258
	V%	7.5/ 10.2	3.5/ 3.8	2.3/ 4.1	6.7/ 7.4	14.7/ 16.9	12.4/ 12.8	7.8/ 8.2	6.7/ 7.8
	H%	100.0/100.0	8.8/ 2.3	4.1/ .6	17.5/ 12.3	32.8/ 37.0	15.5/ 18.3	6.4/ 4.4	14.7/ 24.9
Other Loans	N	888/ 610	90/ 24	65/ 2	165/ 90	243/ 188	127/ 95	56/ 38	142/ 172
	V%	4.6/ 6.0	2.5/ 3.8	2.5/ 1.4	4.4/ 5.2	7.6/ 8.3	7.1/ 6.4	4.7/ 6.8	4.5/ 5.2
	H%	100.0/100.0	10.1/ 3.9	7.3/ .3	18.6/ 14.8	27.4/ 30.8	14.3/ 15.6	6.3/ 6.2	16.0/ 28.2
Other	N	1440/ 563	188/ 29	220/ 7	326/ 102	224/ 119	127/ 79	132/ 35	222/ 191
	V%	7.5/ 5.6	5.2/ 4.6	8.5/ 4.8	8.7/ 5.9	7.0/ 5.2	7.1/ 5.3	11.0/ 6.2	7.0/ 5.8
	H%	100.0/100.0	13.1/ 5.2	15.3/ 1.2	22.6/ 18.1	15.6/ 21.1	8.8/ 14.0	9.2/ 6.2	15.4/ 33.9
Unduplicated Total[5]	N	19327/10131	3637/ 631	2576/ 146	3750/ 1718	3209/ 2272	1797/ 1479	1200/ 562	3149/ 3313

1/Includes mathematics and computer sciences.
2/V denotes vertical percentage; H denotes horizontal percentage.
3/Includes ADAMHA Traineeships and Fellowships.
4/Includes Title IV Foreign Language and Area Studies Fellowships.
5/The 1,795 Ph.D.s who did not report sources of suport are omitted from this table.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

TABLE 4 State of Doctoral Institution of Doctorate Recipients by Sex and Summary Field, 1984

State of Doctoral Institution	Total		Field of Doctorate: Physical Sciences[1]		Engineering		Life Sciences		Social Sciences		Humanities		Prof. Fields		Education	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
U.S. Total	20593	10660	3797	656	2763	152	3957	1788	3488	2407	1942	1586	1313	604	3323	3457
Alabama	141	123	14	2	4	1	50	33	15	18	3	3	8	2	47	64
Alaska	5	1	3	1	0	0	2	0	0	0	0	0	0	0	0	0
Arizona	304	133	74	3	25	2	66	19	44	25	20	17	11	6	64	61
Arkansas	94	34	9	1	12	0	35	4	6	2	3	3	13	4	16	20
California	2569	1175	580	93	479	28	426	204	488	355	218	193	164	57	213	244
Colorado	407	201	84	14	48	0	73	26	67	48	24	28	21	11	90	74
Connecticut	308	192	77	12	28	2	58	49	60	29	60	54	7	1	18	45
Delaware	76	31	31	7	13	3	4	3	12	6	9	7	0	0	7	5
D. C.	298	221	29	11	23	0	24	34	93	47	43	47	48	19	38	63
Florida	606	353	63	11	53	2	94	31	108	65	44	25	55	31	188	188
Georgia	350	208	44	7	47	3	65	21	59	53	25	27	31	9	79	88
Hawaii	74	27	13	1	3	0	23	10	27	11	6	3	1	0	1	2
Idaho	40	9	7	2	5	0	15	1	2	0	2	0	0	0	9	6
Illinois	1166	541	207	32	166	10	186	96	217	124	133	101	87	44	170	134
Indiana	674	306	118	17	106	6	132	52	83	52	93	64	39	14	102	101
Iowa	376	156	70	5	51	2	90	32	39	25	40	25	13	12	73	55
Kansas	253	126	38	0	22	0	59	21	44	25	13	13	9	5	68	62
Kentucky	158	67	10	3	8	1	49	15	25	15	19	9	33	5	14	18
Louisiana	182	81	29	9	6	0	54	19	17	13	28	15	31	6	17	19
Maine	19	6	2	0	0	0	4	0	5	3	4	2	0	0	4	1
Maryland	359	277	76	20	39	2	90	61	48	60	40	42	14	10	52	82
Massachusetts	1168	603	263	50	190	7	169	87	211	145	112	81	58	28	165	205
Michigan	841	413	128	20	108	4	172	67	145	87	84	83	41	13	161	139
Minnesota	334	164	56	9	41	2	106	36	49	32	27	31	19	12	36	41
Mississippi	182	83	12	4	13	0	38	7	42	17	8	6	15	7	54	42
Missouri	405	163	47	5	44	2	73	19	82	46	46	17	32	12	81	62
Montana	37	16	12	2	3	0	7	2	5	6	1	0	0	0	9	6
Nebraska	169	56	14	1	12	1	44	10	36	12	7	8	13	1	43	23
Nevada	12	15	4	0	1	0	0	0	6	7	0	0	0	0	1	8
New Hampshire	43	12	15	1	4	0	13	7	5	4	5	0	0	0	1	0
New Jersey	432	234	112	27	59	5	65	34	52	43	65	55	19	9	60	61
New Mexico	101	66	25	4	14	0	19	3	10	12	9	14	0	0	24	32
New York	2009	1263	382	57	243	16	332	201	432	355	253	229	124	67	243	338
North Carolina	496	247	98	18	50	1	172	80	68	43	38	29	13	12	57	64
North Dakota	32	15	5	2	0	0	15	2	8	2	2	1	0	0	2	8
Ohio	875	439	153	29	137	4	138	55	145	105	72	54	60	43	169	149
Oklahoma	249	122	25	2	50	4	47	15	34	12	16	14	13	11	64	64
Oregon	266	140	49	11	6	1	91	22	36	28	14	14	13	5	56	59
Pennsylvania	1068	610	215	50	162	19	121	84	154	135	87	76	97	29	232	215
Rhode Island	120	59	50	18	16	0	17	7	17	13	20	21	0	0	0	0
South Carolina	119	82	30	5	14	1	26	17	17	11	4	11	8	5	20	32
South Dakota	27	11	0	0	2	0	5	0	5	2	0	0	0	0	15	9
Tennessee	335	203	29	3	39	4	72	22	42	37	28	16	20	15	105	106
Texas	1116	622	192	30	172	10	223	134	141	122	86	69	101	46	200	210
Utah	274	97	41	3	43	1	59	14	57	18	16	4	1	5	57	52
Vermont	17	18	3	2	0	0	7	5	4	9	3	2	0	0	0	0
Virginia	401	187	65	20	76	6	78	28	64	32	25	10	27	14	65	76
Washington	373	169	74	11	38	0	108	42	63	50	26	16	20	11	44	39
West Virginia	76	40	5	0	13	0	17	5	14	11	7	1	0	0	20	23
Wisconsin	517	228	101	17	73	2	115	51	79	34	52	46	34	23	62	53
Wyoming	36	13	12	2	2	0	9	1	6	1	0	0	0	0	7	9
Puerto Rico	4	2	2	2	0	0	0	0	0	0	2	0	0	0	0	0

1/Includes mathematics and computer sciences.

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

TABLE 5 Statistical Profile of Doctorate Recipients by Racial/Ethnic Group and U.S. Citizenship Status, 1984[1/]

		Total				American Indian	Asian				Black			
		U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total
Total Number		23951	1216	4817	31253[2/]	74	512	505	2292	3389[2/]	948	101	417	1486[2/]
Male	%	61.3	73.1	85.5	65.9	73.0	66.0	76.6	86.3	81.9	44.9	79.2	91.1	60.5
Female		38.7	26.9	14.5	34.1	27.0	34.0	23.4	13.7	18.1	55.1	20.8	8.9	39.5
Doctoral Field														
Physical Sciences[3/]	%	13.1	16.1	20.6	14.2	10.8	20.7	21.2	24.4	23.4	3.7	8.9	8.4	5.3
Engineering		5.2	22.5	26.3	9.3	4.1	18.6	30.7	32.7	30.4	1.3	3.0	12.0	4.5
Life Sciences		19.0	15.9	17.0	18.4	16.2	26.0	17.2	15.0	16.9	7.9	21.8	22.3	13.0
Social Sciences		19.8	15.9	13.2	18.9	13.5	13.1	10.5	11.1	11.3	20.4	28.7	14.4	19.2
Humanities		12.3	11.8	5.2	11.3	6.8	5.5	5.5	3.0	3.8	9.8	7.9	5.8	8.6
Education		24.6	10.6	11.1	21.7	43.2	11.7	6.3	8.3	8.4	50.9	25.7	27.3	42.5
Professions & Other		6.0	7.2	6.6	6.2	5.4	4.5	8.5	5.5	5.8	6.0	4.0	9.8	6.9
Median Age at Doctorate		33.2	32.7	32.4	33.0	35.5	32.3	32.4	32.1	32.1	37.4	34.7	34.9	36.3
Median Time Lapse BA-PhD														
Total Time	Yrs	10.3	9.5	9.1	10.0	11.8	9.3	9.9	9.3	9.4	13.8	8.9	8.5	11.6
Registered Time		7.0	6.7	6.0	6.8	6.8	6.6	7.0	6.0	6.2	7.6	6.3	5.3	6.7
Graduate School Support														
Federal Fellow/Trainee	%	16.8	6.6	5.0	13.9	33.8	21.3	6.3	5.5	7.8	17.7	4.0	7.4	13.7
GI Bill		5.0	.1	.0	3.9	8.1	.8	.2	.1	.2	5.2	.0	.0	3.3
National Fellowship		4.7	3.8	4.5	4.5	4.1	5.9	4.4	3.6	4.0	10.4	3.0	6.5	8.7
Teaching Assistantship		46.9	52.1	41.8	44.5	41.9	38.9	51.1	44.6	43.9	30.6	33.7	29.7	30.3
Research Assistantship		37.3	49.3	50.4	38.3	25.7	51.6	60.2	61.4	58.5	20.1	32.7	30.7	23.9
Other University		28.8	27.1	22.6	26.7	21.6	29.9	21.8	20.4	21.6	31.9	33.7	25.9	30.0
Business/Employer		4.7	3.5	3.0	4.2	1.4	5.1	4.2	2.1	2.8	7.2	1.0	5.3	6.1
Self/Family Sources		80.8	70.6	48.9	72.4	73.0	72.1	65.5	47.5	52.9	81.0	77.2	48.2	70.9
Guaranteed Student Loan		21.9	12.3	.7	17.4	27.0	18.6	9.1	.3	4.4	25.0	26.7	1.7	18.2
Other Loans		14.1	8.7	2.4	11.5	14.9	14.8	5.7	1.5	4.2	20.3	18.8	2.9	15.0
Other		3.5	7.3	22.5	6.4	6.8	2.5	3.2	12.4	9.2	3.9	15.8	33.6	13.1
Unknown		1.7	1.4	3.3	5.7	2.7	1.2	2.4	3.0	4.5	1.3	.0	3.6	2.6
Postdoctoral Plans														
Postdoctoral Study	%	20.4	21.5	26.1	20.5	12.2	29.1	23.4	32.1	29.6	7.7	17.8	13.7	10.1
Planned Employment		76.9	74.1	67.9	72.5	79.7	68.6	72.3	61.9	63.1	89.2	77.2	81.8	85.5
Educ. Institution		44.7	38.6	42.9	42.5	45.9	24.8	29.9	37.1	33.4	61.3	48.5	51.1	57.1
Industry/Business		14.7	24.3	11.2	13.9	6.8	25.8	33.9	14.3	18.6	7.1	7.9	6.7	6.9
Government		8.1	3.1	8.0	7.6	10.8	9.8	3.0	5.7	5.8	10.8	5.0	16.1	11.8
Non-profit		5.6	3.9	1.8	4.7	10.8	3.9	3.0	1.6	2.1	4.7	8.9	2.2	4.2
Other & Unknown		3.8	4.3	4.0	3.7	5.4	4.3	2.6	3.2	3.2	5.4	6.9	5.8	5.5
Postdoct Status Unknown	%	2.7	4.4	6.0	7.0	8.1	2.3	4.4	6.0	7.2	3.1	5.0	4.6	4.4
Definite Postdoct Study	%	15.1	11.6	15.1	14.4	6.8	21.1	12.1	19.5	18.2	4.5	4.0	6.0	4.9
Seeking Postdoct Study		5.2	10.0	11.1	6.1	5.4	8.0	11.3	12.6	11.4	3.2	13.9	7.7	5.2
Definite Employment		55.8	44.1	46.0	51.7	51.4	44.7	43.0	40.6	40.7	62.7	28.7	49.4	56.0
Seeking Employment		21.1	30.0	21.9	20.8	28.4	23.8	29.3	21.3	22.4	26.6	48.5	32.4	29.5
Employment Location after Doctorate														
U.S.	%[4/]	91.2	84.1	29.2	82.5	89.5	91.3	84.3	39.7	55.4	84.5	72.4	6.8	64.7
Foreign		1.1	6.3	63.1	9.8	.0	.9	6.5	52.1	36.4	1.5	13.8	83.0	22.2
Unknown		7.7	9.5	7.7	7.8	10.5	7.9	9.2	8.2	8.3	14.0	13.8	10.2	13.1

1/See discussion on page 26 for description of past changes in the survey question on racial/ethnic group.
2/Includes individuals who did not report their citizenship at time of doctorate.
3/Includes mathematics and computer sciences.
4/The base for this percentage is the number of doctorates in the column caption group who have found definite employment.

Table 5 (Continued)

White				Puerto Rican	Mexican-American				Other Hispanic				[illegible] & [illegible]		
U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	U.S.	Non-U.S. Perm.	Non-U.S. Temp.	Total	U.S.	Non-U.S.	Total
21283	509	1486	23321[2]/	133	168	10	17	195[2]/	233	61	283	588[2]/	601	351	2067[2]/
61.7	68.8	82.0	63.2	56.4	58.3	50.0	100.0	61.5	59.7	68.9	83.0	72.1	70.2	89.2	73.1
38.3	31.2	18.0	36.8	43.6	41.7	50.0	.0	38.5	40.3	31.1	17.0	27.9	29.8	10.8	26.9
13.3	13.2	19.0	13.6	9.0	6.5	.0	17.6	7.2	12.9	16.4	25.4	19.4	17.5	12.3	12.4
5.0	18.7	23.4	6.5	5.3	2.4	20.0	17.6	4.6	4.7	16.4	15.2	11.1	7.7	24.2	11.0
19.6	13.6	15.6	19.2	9.0	7.1	.0	29.4	8.7	12.9	18.0	25.8	19.6	20.0	21.4	17.0
20.0	19.3	14.7	19.6	24.1	23.2	10.0	35.3	23.6	24.0	13.1	16.3	19.2	17.0	15.1	21.8
12.4	17.7	8.1	12.3	16.5	13.7	20.0	.0	12.8	23.2	19.7	5.3	13.9	13.6	7.1	13.2
23.8	10.8	11.6	22.7	27.8	39.9	50.0	.0	36.9	17.6	11.5	9.5	13.3	17.0	10.3	16.5
6.0	6.9	7.6	6.1	8.3	7.1	.0	.0	6.2	4.7	4.9	2.5	3.6	7.3	9.7	8.1
33.0	32.6	31.9	32.9	34.4	35.7	32.5	33.9	35.0	34.0	33.3	33.2	33.5	32.3	33.4	33.0
10.2	9.1	8.6	10.0	11.6	11.8	10.0	10.0	11.5	10.1	9.4	9.3	9.6	9.6	9.5	9.6
6.9	6.6	6.1	6.9	7.3	7.5	7.5	5.3	7.2	7.1	6.1	5.5	6.1	6.9	6.2	6.6
16.6	6.9	4.3	15.6	24.8	25.6	20.0	.0	23.1	21.0	9.8	3.5	11.2	10.1	2.8	3.5
5.2	.0	.0	4.7	6.0	8.3	.0	.0	7.2	3.0	.0	.0	1.2	2.0	.0	.6
4.3	2.9	4.5	4.3	16.5	12.5	10.0	5.9	11.8	3.9	6.6	8.5	6.3	3.3	4.3	1.7
48.4	58.2	45.9	48.4	34.6	35.7	30.0	29.4	34.9	47.2	50.8	35.0	41.0	33.9	26.2	14.8
38.2	42.8	45.2	38.7	23.3	22.0	50.0	52.9	26.2	32.6	42.6	39.6	36.6	29.0	31.9	14.2
29.0	29.9	26.3	28.8	33.8	25.6	30.0	17.6	25.1	33.0	34.4	25.8	29.4	16.6	15.4	7.5
4.7	3.7	3.5	4.6	6.0	4.8	.0	.0	4.1	2.6	1.6	4.9	3.6	2.2	2.0	1.0
82.2	76.2	55.6	80.3	73.7	83.3	60.0	41.2	78.5	81.1	57.4	43.8	59.7	42.8	37.3	18.9
22.0	13.0	1.1	20.5	31.6	24.4	10.0	.0	21.5	22.7	8.2	1.1	10.5	10.3	1.4	3.3
13.9	8.3	3.4	13.1	20.3	21.4	50.0	5.9	21.5	15.0	13.1	3.5	9.0	7.8	2.8	2.8
3.5	8.8	27.7	5.1	6.0	3.6	20.0	70.6	10.3	3.0	11.5	38.2	20.7	2.0	37.3	7.0
.7	.6	1.7	.8	2.3	.0	.0	.0	.0	.9	.0	2.1	2.7	40.1	12.8	67.1
21.1	19.8	24.0	21.2	10.5	7.7	10.0	11.8	8.2	18.9	26.2	22.6	21.1	15.6	14.5	7.3
77.2	76.4	71.5	76.8	85.7	91.1	80.0	88.2	90.3	78.5	72.1	74.6	74.8	47.4	67.8	25.9
44.8	44.6	47.5	45.0	48.1	56.0	70.0	41.2	55.4	48.5	49.2	48.4	47.8	25.8	44.7	15.5
15.0	19.3	9.4	14.7	12.0	10.1	.0	11.8	9.7	12.9	16.4	8.1	10.7	10.5	7.7	4.5
8.0	2.9	7.9	7.8	12.0	14.3	.0	29.4	14.9	10.7	1.6	10.2	9.5	4.0	10.3	3.0
5.7	4.3	2.2	5.5	6.0	4.8	.0	.0	4.1	3.4	1.6	2.8	2.9	2.5	.6	.8
3.7	5.3	4.4	3.8	7.5	6.0	10.0	5.9	6.2	3.0	3.3	4.9	3.9	4.7	4.6	2.1
1.7	3.7	4.5	2.0	3.8	1.2	10.0	.0	1.5	2.6	1.6	2.8	4.1	36.9	17.7	66.8
15.7	11.6	13.2	15.5	6.0	6.0	.0	11.8	6.2	12.4	18.0	11.3	12.2	11.8	8.5	5.0
5.3	8.3	10.8	5.7	4.5	1.8	10.0	.0	2.1	6.4	8.2	11.3	8.8	3.8	6.0	2.3
56.4	49.1	49.6	55.8	55.6	60.1	40.0	70.6	60.0	53.2	44.3	58.7	54.1	32.8	48.4	18.3
20.8	27.3	21.9	21.0	30.1	31.0	40.0	17.6	30.3	25.3	27.9	15.9	20.7	14.6	19.4	7.6
91.8	84.8	28.1	88.1	86.5	86.1	75.0	16.7	78.6	89.5	92.6	18.1	52.5	81.2	18.2	52.8
1.0	5.2	65.5	4.7	.0	1.0	25.0	75.0	9.4	2.4	3.7	76.5	41.2	4.6	71.2	34.6
7.2	10.0	6.4	7.2	13.5	12.9	.0	8.3	12.0	8.1	3.7	5.4	6.3	14.2	10.6	12.7

SOURCE: National Research Council, Office of Scientific and Engineering Personnel, Doctorate Records File.

APPENDIX B: Institutional Categories Derived from 1976 Carnegie Classification System*

Carnegie Class	Derived Type	Number** in Type	Bases for Being in Category
1.1	I	50	Support: Universities that led in terms of federal financial support for science in two out of three academic years 1972-73, 1973-74, 1974-75 Program: 50 or more Ph.D.s awarded in 1973-74
1.2-1.4	II	128	Program: 20 or more Ph.D.s awarded in 1973-74 in any field, or 10 or more Ph.D.s in at least three fields
2.1-2.2	III	548	Program: Liberal arts program plus at least one other professional or occupational program; highest degree is Master's or there is an extremely limited doctorate program Size: 1,000 or more at public ones; 1,500 or more at private institutions
3.1-3.2	IV	430	Program: Predominantly bachelor's degree level with a strong liberal arts tradition
5.1-5.9	V	80	Program: Exclusively or almost exclusively technical or professional programs in areas such as theology, medicine, engineering, business, art, music, law, and teaching

* Carnegie Commission on Higher Education, A Classification of Institutions of Higher Education, (rev. ed.). Berkeley: The Carnegie Foundation for the Advancement of Teaching, 1976.

**The number in this column refers to the number of institutions used in the analysis of B.A. sources and excludes colleges or universities whose graduates were too few to develop reliable "productivity" ratios.

Research I (Type I): The 50 leading universities in terms of federal financial support of academic science in at least two of the three academic years 1972-73, 1973-74, and 1974-75, provided they awarded at least 50 Ph.D.s in 1973-74. Examples include University of California at Berkeley, University of Texas at Austin, Duke University, and University of Chicago.

Other Doctorate-Granting (Type II): A sum of the Carnegie categories of Research II, Doctorate-Granting I, and Doctorate-Granting II institutions with established doctoral programs that awarded at least 20 Ph.D.s in 1973-74. In 1984, 132 Other Doctorate-Granting universities were reported as B.A. sources. Examples include Iowa State University, University of South Florida, Howard University (DC), and Rensselaer Polytechnic Institute (NY).

Comprehensive University and Colleges (Type III): Institutions that offered a liberal arts program as well as other programs such as engineering, business administration, and nursing. Many offered master's degrees, but all either lacked or had an extremely limited doctoral program. Former teachers colleges that broadened their curricula in the 1960s are included in this category. Five hundred sixty-five comprehensive institutions were B.A. sources for the 1984 Ph.D.s. Examples include Glassboro State College (NJ), Old Dominion University (VA), Creighton University (NE), and Aquinas College (MI).

Liberal Arts Colleges (Type IV): Predominantly bachelor's-degree granting institutions with a strong liberal arts traditon. Thus, institutions such as Oberlin College are included even though they have master's degree programs. Examples of the 456 colleges in this category reported as B.A. sources in 1984 include Reed (OR), Bryn Mawr (PA), College of Charleston (SC), and Fisk University (TN).

Specialized Institutions (Type V): Those with primarily focused technical or professional programs in a range of areas such as theology, medicine, engineering, business, art, music, law, and teaching. There were 143 specialized institutions reported as B.A. sources in 1984 including Princeton Theological Seminary (NJ), University of Oklahoma Health Science Center, Rose-Hulman Institute of Technology (IN), Peabody Institute (MD), and Teacher's College of Columbia University (NY).

APPENDIX C: Field Lists of Leading B.A. Producers of 1984 Ph.D.s*

Institution**	n/N	Type***
Physical Sciences		
1. Harvey Mudd College/CA	20/71	IV, Private
2. California Institute of Technology	41/195	I, Private
3. Massachusetts Institute of Technology	76/1065	I, Private
4. Swarthmore College/PA	16/280	IV, Private
5. Reed College/OR	10/205	IV, Private
6. Carleton College/MN	13/333	IV, Private
7. University of Chicago/IL	15/446	I, Private
8. Washington College/MD	5/149	IV, Private
9. University of California-San Diego	32/991	I, Private
10. Colorado School of Mines	8/255	V, Public
Engineering		
1. California Institute of Technology	23/195	I, Private
2. Massachusetts Institute of Technology	63/1065	I, Private
3. Stevens Institute/NJ	8/256	V, Private
4. Harvey Mudd College/CA	2/71	IV, Private
5. Rensselaer Polytechnic Institute/NY	21/805	II, Private
6. Cornell University/NY	31/1616	I, Private
7. Carnegie-Mellon University/PA	12/648	II, Private
8. Worcester Polytechnic Institute/MA	7/392	V, Private
9. Clarkson College of Technology/NY**	10/572	V, Private
10. Rice University/TX	11/650	II, Private
Life Sciences		
1. Reed College/OR	12/205	IV, Private
2. University of Chicago/IL	22/446	I, Private
3. Cornell University/NY	73/1616	I, Private
4. Kalamazoo College/MI	8/218	IV, Private
5. California Institute of Technology	7/195	I, Private
6. Thomas Jefferson University/PA	2/58	V, Private
7. Brandeis University/MA	18/531	II, Private
8. Harvard University/MA	37/1122	I, Private
9. Massachusetts Institute of Technology	34/1065	I, Private
10. St. Johns College/MD	2/63	IV, Private
Social Sciences		
1. St. Mary's Seminary & University/MD	4/51	IV, Private
2. University of Chicago/IL	29/446	I, Private
3. Swarthmore College/PA	16/280	IV, Private
4. Brandeis University/MA	27/531	II, Private
5. Barnard College-Columbia Univ/NY	25/497	IV, Private
6. Reed College/OR	10/205	IV, Private
7. New College/FL**	7/147	IV, Private
8. Sarah Lawrence College/NY	10/219	IV, Private
9. Oberlin College/OH	28/623	IV, Private
10. Bryn Mawr College/PA	9/211	IV, Private

Institution**	n/N	Type***
Humanities		
1. New England Conservatory of Music/MA	5/52	V, Private
2. Westminster Choir College/NJ	6/85	V, Private
3. Haverford College/PA	8/162	IV, Private
4. Bennington College/VT	6/125	IV, Private
5. Wellesley College/MA	22/467	IV, Private
6. Boston Conservatory of Music/MA	3/66	V, Private
7. Juillard School/NY	5/118	V, Private
8. Barnard College-Columbia Univ/NY	21/497	IV, Private
9. Amherst College/MA	13/309	IV, Private
10. Reed College/OR	8/205	IV, Private
Education		
1. Covenant College/TN	3/66	IV, Private
2. William Jewell College/MO	10/223	III, Private
3. Phillips University/OK	7/172	IV, Private
4. Wiley College/TX	3/79	IV, Private
5. Our Lady of Angels College/PA**	2/54	IV, Private
5. Yankton College/SD	3/81	IV, Private
7. Kalamazoo College/MI	8/218	IV, Private
8. Trinity College/DC	5/139	IV, Private
9. Wilson College/PA	3/84	IV, Private
10. Alverno College/WI	5/144	IV, Private
Professional and Other		
1. William Jewell College/MO	5/223	III, Private
2. St. Mary's Seminary & University/MD	1/51	IV, Private
3. Concordia Theological Seminary/IN	3/156	IV, Private
4. Oklahoma Baptist University	5/277	III, Private
5. Louisiana College	3/169	IV, Private
6. Clark College/GA	3/172	III, Private
7. Palm Beach Atlantic College/FL	1/58	IV, Private
8. Howard Payne College/TX**	4/239	IV, Private
9. Wheeling College/WV	2/121	IV, Private
10. Wayland Baptist College/TX**	2/122	IV, Private

*"Productivity" of 1984 Ph.D.s in each field from schools that graduated 50 or more students in any category in 1974.

**Named institutions refer to main campuses, unless otherwise noted. Some institution names have changed since 1974: Clarkson College of Technology is Clarkson University; New College has affiliated with the University of South Florida and is a public Other Doctorate-Granting institution; Our Lady of Angels College is Neumann College; Howard Payne College is Howard Payne University; Wayland Baptist College is Wayland Baptist University.

***Type Legend:
I=Type I
II=Type II
III=Type III
IV=Type IV
V=Type V

Form Approved
OMB No. 3145-0019
Approval Expires 1/85

SURVEY OF EARNED DOCTORATES, 1983-84

This form is to be returned to the GRADUATE DEAN, for forwarding to .....

The Office of Scientific and Engineering Personnel
National Research Council
2101 Constitution Avenue, Washington, D. C. 20418

Please print or type.

1. Name in full: ..... (9-30)
(Last Name) (First Name) (Middle Name)

Cross Reference: Maiden name or former name legally changed .....

2. Permanent address through which you could always be reached: (Care of, if applicable) .....

..... (Number) (Street) (City)

..... (State) (Zip Code) (Or Country if not U.S.)

3. U.S. Social Security Number: — — — – — — – — — — (33-41)

4. Date of birth: ..... (10-14) (Month) (Day) (Year) Place of birth: ..... (15-16) (State) (Or Country if not U.S.)

5. Sex: 1 ☐ Male 2 ☐ Female (17)

6. Marital status: 1 ☐ Married 2 ☐ Not married (including widowed, divorced) (18)

7. Citizenship: 0 ☐ U.S. native 2 ☐ Non-U.S., Immigrant (Permanent Resident) (19)
1 ☐ U.S. naturalized 3 ☐ Non-U.S., Non-Immigrant (Temporary Resident)
If Non-U.S., indicate country of present citizenship ..... (20-21)

8. What is your racial background? (Check only one) 0 ☐ American Indian or Alaskan Native 2 ☐ Black 1 ☐ Asian or Pacific Islander 3 ☐ White (22)

9a. Is your ethnic heritage Hispanic? ☐ Yes ☐ No (23)

9b. If yes, is it: 0 ☐ Mexican American 1 ☐ Puerto Rican 2 ☐ Other Hispanic (24)

10. Number of dependents: ..... Do not include yourself. (Dependent = someone receiving at least one half of his or her support from you) (25)

EDUCATION

11. Location of high school last attended: ..... (26-27)
(State) (or country if not U.S.)

Year of graduation from high school: ..... (28-29)

12. List in the table below all collegiate and graduate institutions you have attended including 2-year colleges. List chronologically, and include your doctoral institution as the last entry.

Institution Name	Location	Years Attended From	Years Attended To	Major Field Use Specialties List Name	Major Field Use Specialties List Number	Degree (if any) Title of Degree	Degree (if any) Granted Mo.	Degree (if any) Granted Yr.

13. Enter below the title of your doctoral dissertation and the most appropriate classification number and field. If a project report or a musical or literary composition (not a dissertation) is a degree requirement, please check box. ☐ (12)

Title .....
.....
.....

Classify using Specialties List
Number ..... Name of field .....

14. Name the department (or interdisciplinary committee, center, institute, etc.) and school or college of the university which supervised your doctoral program: .....
(Department/Institute/Committee/Program) (School)

15. Name of your adviser for dissertation, project report or music/literary composition: .....
(Last Name) (First Name) (Middle Initial)

continued on next page

16. Please enter a "1" beside your primary source of support during graduate study. Enter a "2" beside your secondary source of support during graduate study. Check (✓) all other sources from which support was received.

Own/Family Resources
- a ___ Own Earnings
- b ___ Spouse's Earnings
- c ___ Family Contributions

University-Related
- d ___ Teaching Assistantship
- e ___ Research Assistantship
- f ___ University Fellowship
- g ___ College Work-Study
- h ___ Other

..... (Specify)

Federal Support
- i ___ NIH Traineeship
- j ___ ADAMHA Traineeship
- k ___ ADAMHA Fellowship
- l ___ Other HHS
- m ___ NSF Fellowship
- n ___ Title VI Foreign Language and Area Studies Fellowship
- o ___ Title IX Graduate & Professional Opportunities Pgm. Fellowship
- p ___ Other Dept of ED
- q ___ Veterans Administration (G.I. Bill, etc.)
- r ___ Other Federal

..... (Specify)

Nationally Competitive Fellowships (Non-Federal)
- s ___ Ford Foundation
- t ___ Rockefeller Foundation
- u ___ Other Fellowship

..... (Specify)

Student Loans
- v ___ Guaranteed Student Loan
- w ___ National Direct Student Loan
- x ___ Other Loan

..... (Specify)

Other Sources
- y ___ Business/Employer Funds
- z ___ Other

..... (Specify)

17a. Please check the category which most fully describes your status during the year immediately preceding the doctorate.
- 0 ☐ Full-time employed (Go to Item "17b")
- 1 ☐ Held fellowship
- 2 ☐ Held assistantship
- 3 ☐ Part-time employed
- 4 ☐ Not employed
- 5 ☐ Other (specify) .....

17b. If full-time employed, what type of position did you hold?
- 6 ☐ College or university, faculty
- 7 ☐ College or university, non-faculty
- 8 ☐ Elem. or sec. school, teaching
- 9 ☐ Elem. or sec. school, non-teaching
- (11) ☐ Industry or business
- (12) ☐ Other (specify) .....

(50)

POSTGRADUATION PLANS

18. What is the status of your current postgraduate plans?
- 0 ☐ Am returning to, or continuing in, predoctoral employment
- 1 ☐ Have signed contract or made definite commitment
- 2 ☐ Am negotiating with one or more specific organizations
- 3 ☐ Am seeking position but have no specific prospects
- 4 ☐ Other (specify) ..... (51)

19. What best describes your immediate postgraduate plans?
- 0 ☐ Postdoctoral fellowship
- 1 ☐ Postdoctoral research associateship
- 2 ☐ Traineeship
- 3 ☐ Other study (specify) .....

} Go to Item "20"

- 4 ☐ Employment (other than 0, 1, 2, 3)
- 5 ☐ Military service
- 6 ☐ Other (specify) ..... (52)

} Go to Item "21"

20. If you plan to have a postdoctoral fellowship, associateship, traineeship, or otherwise undertake further study

A. What was the most important reason for taking a postdoctoral appointment? (Check only one.)
- 0 ☐ To obtain additional research experience in my doctoral field
- 1 ☐ To work with a particular scientist or research group
- 2 ☐ To switch into a different field of research
- 3 ☐ Could not obtain the desired type of employment position
- 4 ☐ Other reason (specify) ..... (53)

B. What will be the field of your postdoctoral study?
Please enter number from Specialties List ..... (54-56)

C. What will be the primary source of research support?
- 0 ☐ U.S. Government
- 1 ☐ College or university
- 2 ☐ Private foundation
- 3 ☐ Nonprofit, other than private foundation
- 4 ☐ Other (specify)

.....
- 6 ☐ Unknown (57)

Go to Item "22"

21. If you plan to be employed, enter military service, or other—

A. What will be the type of employer?
- a ☐ 4-year college or university other than medical school
- b ☐ Foreign university
- c ☐ Medical school
- d ☐ Jr. or community college
- e ☐ Elem. or sec. school
- f ☐ Foreign government
- g ☐ U.S. Federal government
- h ☐ U.S. state government
- i ☐ U.S. local government
- j ☐ Nonprofit organization
- k ☐ Industry or business
- l ☐ Self-employed
- m ☐ Other (specify) ..... (58)

B. Indicate what your *primary* work activity will be with "1" in appropriate box; *secondary* work activity (if any) with "2" in appropriate box.
- 0 ☐ Research and development
- 1 ☐ Teaching
- 2 ☐ Administration
- 3 ☐ Professional services to individuals
- 5 ☐ Other (specify) ..... (59-60)

C. In what field will you be working?
Please enter number from Specialties List ..... (61-63)

D. Did you seriously consider undertaking postdoctoral study?
Yes ___ No ___ (64)

If yes, why did you decide against the postdoctoral?
- 0 ☐ No postdoctoral appointment available
- 1 ☐ Felt that I would derive little or no benefit from a postdoctoral appointment
- 2 ☐ Postdoctoral available but stipend inadequate
- 3 ☐ Had more attractive employment opportunity
- 4 ☐ Other (specify) ..... (65)

Go to Item "22"

22. What is the name and address of the organization with which you will be associated?

..... (Name of Organization)

..... (Street) ..... (City, State) (Or Country if not U.S.) (66-71)

BACKGROUND INFORMATION

23. Please indicate, by circling the highest grade attained, the education of

your father:	none	1 2 3 4 5 6 7 8 Elementary school	9 10 11 12 High school	1 2 3 4 College	MA, MD PhD Graduate / Postdoctoral (72)
your mother	none 0	1 2 3 4 5 6 7 8 1 2 3	9 10 11 12 4 5	1 2 3 4 6 7	MA, MD PhD 8 9 / Postdoctoral (11) (73)

Signature ..... Date ..... (74-76)

If you would like to receive a summary of the results of this survey, please check box. ☐ (79)

SPECIALTIES LIST

Instructions: The following field listing is to be used in responding to items 12, 13, 20b, and 21c. If a field marked with an asterisk (*) is chosen in item 12 or 13, please write in your field of specialization in the space provided.

AGRICULTURE

000 Agricultural Economics

005 Animal Breeding & Genetics
010 Animal Nutrition
019 Animal Sciences, Other*

020 Agronomy
025 Plant Breeding & Genetics
030 Plant Path. (See also 120)
039 Plant Sciences, Other*

040 Food Sciences
045 Soil Sciences
050 Horticulture Science
055 Fisheries Sciences
060 Wildlife Management
065 Forestry Science

098 Agriculture, General
099 Agriculture, Other*

BIOLOGICAL SCIENCES

100 Biochemistry
105 Biophysics

110 Bacteriology
115 Plant Genetics
120 Plant Path. (See also 030)
125 Plant Physiology
129 Botany, Other*

130 Anatomy
133 Biometrics & Biostatistics
136 Cell Biology
139 Ecology
142 Embryology
145 Endocrinology
148 Entomology
151 Immunology
154 Molecular Biology
157 Microbiology
160 Neurosciences
163 Nutritional Sciences
166 Parasitology
169 Toxicology

170 Human & Animal Genetics
175 Human & Animal Pathology
180 Human & Animal Pharmacology
185 Human & Animal Physiology
189 Zoology, Other*

198 Biological Sciences, General
199 Biological Sciences, Other*

HEALTH SCIENCES

200 Audiology & Speech Pathology
210 Environmental Health
220 Epidemiology
230 Nursing
240 Pharmacy
250 Veterinary Medicine
298 Health Sciences, General
299 Health Sciences, Other*

ENGINEERING

300 Aerospace, Aeronautical & Astronautical
303 Agricultural
306 Bioengineering & Biomedical
309 Ceramic
312 Chemical
315 Civil
318 Communications
321 Computer
324 Electrical, Electronics
327 Engineering Mechanics
330 Engineering Physics
333 Engineering Science
336 Environmental Health Engin.
339 Industrial
342 Materials Science
345 Mechanical
348 Metallurgical
351 Mining & Mineral
354 Naval Arch. & Marine Engin.
357 Nuclear
360 Ocean
363 Operations Research (See also 465, 930)
366 Petroleum
369 Polymer
372 Systems
398 Engineering, General
399 Engineering, Other*

COMPUTER AND INFORMATION SCIENCES

400 Computer Sciences*
410 Information Sci. & Systems*

MATHEMATICS

420 Applied Mathematics
425 Algebra
430 Analysis & Functional Anal.
435 Geometry
440 Logic (See also 785)
445 Number Theory
450 Probability & Math. Statistics (See also 690)
455 Topology
460 Computing Theory & Practice
465 Operations Research (See also 363, 930)
498 Mathematics, General
499 Mathematics, Other*

PHYSICAL SCIENCES

Astronomy

500 Astronomy
505 Astrophysics

Atmospheric & Meteorological Sciences

510 Atmospheric Physics & Chem.
512 Atmospheric Dynamics
514 Meteorology
518 Atmos. & Meteorol. Sci., Gen.
519 Atmos. & Meteorol. Sci., Other*

Chemistry

520 Analytical
522 Inorganic
524 Nuclear
526 Organic
528 Pharmaceutical
530 Physical
532 Polymer
534 Theoretical
538 Chemistry, General
539 Chemistry, Other*

Geological Sciences

540 Geology
542 Geochemistry
544 Geophysics & Seismology
546 Paleontology
548 Mineralogy, Petrology
550 Stratigraphy, Sedimentation
552 Geomorphology & Glacial Geology
554 Applied Geology
558 Geological Sciences, General
559 Geological Sciences, Other*

Physics

560 Acoustics
561 Atomic & Molecular
562 Electron
564 Elementary Particle
566 Fluids
568 Nuclear
569 Optics
570 Plasma
572 Polymer
574 Solid State
578 Physics, General
579 Physics, Other*

Other Physical Sciences

580 Environmental Sciences
585 Hydrology & Water Resources
590 Oceanography
595 Marine Sciences
599 Physical Sciences, Other*

PSYCHOLOGY

600 Clinical
603 Cognitive
606 Comparative
609 Counseling
612 Developmental
615 Experimental
618 Educational
621 Industrial & Organizational (See also 935)
624 Personality
627 Physiological
630 Psychometrics
633 Quantitative
636 School (See also 825)
639 Social
648 Psychology, General
649 Psychology, Other*

SOCIAL SCIENCES

650 Anthropology
652 Area Studies
658 Criminology
662 Demography
666 Economics
668 Econometrics
670 Geography
674 International Relations
678 Political Sci. & Government
682 Public Policy Studies
686 Sociology
690 Statistics (See also 450)
694 Urban Studies
698 Social Sciences, General
699 Social Sciences, Other*

HUMANITIES

History

700 History, American
705 History, European
710 History of Science
718 History, General
719 History, Other*

Letters

720 Classics
723 Comparative Literature
726 English Language
729 Linguistics
732 Literature, American
733 Literature, English
736 Speech & Debate
738 Letters, General
739 Letters, Other*

Foreign Languages and Literature

740 French
743 German
746 Italian
749 Spanish
752 Russian
755 Slavic (other than Russian)
758 Chinese
762 Japanese
765 Hebrew
768 Arabic
769 Other Languages*

Other Humanities

770 American Studies
773 Archeology
776 Art History & Criticism
780 Music
785 Philosophy (See also 440)
790 Religion (See also 984)
795 Theatre
798 Humanities, General
799 Humanities, Other*

EDUCATION

800 Curriculum & Instruction
805 Educ. Admin. & Superv.
810 Educational Media
815 Educ. Stat. & Research
820 Educ. Testing, Eval. & Meas.
825 School Psych. (See also 636)
830 Social Foundations
835 Special Education
840 Student Counseling & Personnel Services
845 Higher Education

Teacher Education

850 Pre-elementary
852 Elementary
854 Junior High
856 Secondary
858 Adult & Continuing

Teaching Fields

860 Agricultural Educ.
861 Art Educ.
862 Business Educ.
864 English Educ.
866 Foreign Languages Educ.
868 Health Educ.
870 Home Economics Educ.
872 Industrial Arts Educ.
874 Mathematics Educ.
876 Music Educ.
878 Nursing Educ.
880 Physical Educ.
882 Reading Educ.
884 Science Educ.
885 Social Science Educ.
886 Speech Educ.
888 Trade & Industrial Educ.
889 Teacher & Educ. Specific Subject Areas, Other*

898 Education, General
899 Education, Other*

PROFESSIONAL FIELDS

Business & Management

900 Accounting
905 Banking & Finance
910 Business Admin. & Management
915 Business Economics
920 Marketing Mngmnt. & Research
925 Business Statistics
930 Operations Research (See also 363, 465)
935 Organiz. Beh. (See also 621)
938 Business & Mngmnt., General
939 Business & Mngmnt., Other*

Communications

940 Communications Research
945 Journalism
950 Radio & Television
958 Communications, General
959 Communications, Other*

Other Professional Fields

960 Architec. & Environ. Design
964 Home Economics
968 Law
972 Library & Archival Science
976 Public Administration
980 Social Work
984 Theology (See also 790)
988 Professional Fields, General
989 Professional Fields, Other*

999 OTHER FIELDS*

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